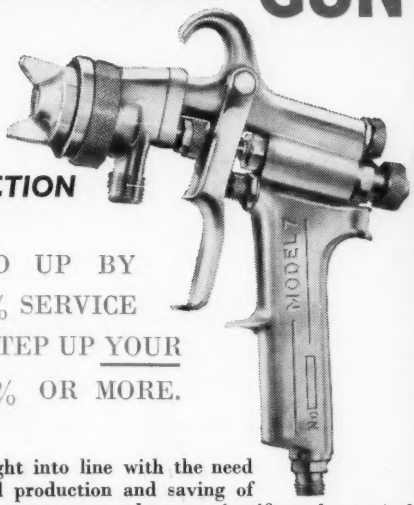
INDUSTRIAL
OCT 19 1953
FINISHING

# THE WORLD'S FINEST GUN

***FOR LARGE SCALE***
***AIRCRAFT AND***
***INDUSTRIAL PRODUCTION***




DELIVERIES STEPPED UP BY OVER 150%. OUR 100% SERVICE WILL ASSIST YOU TO STEP UP YOUR PRODUCTION BY 150% OR MORE.

**The A.I.D. Model 7 Gun falls right into line with the need of industry to effect increased production and saving of man-hours. This gun has been put to every known scientific and practical test, and its economic performance and mechanical perfection have made it the outstanding choice of great industrial organisations all over the world.**

## *AND THE WORLD'S FINEST* SERVICE

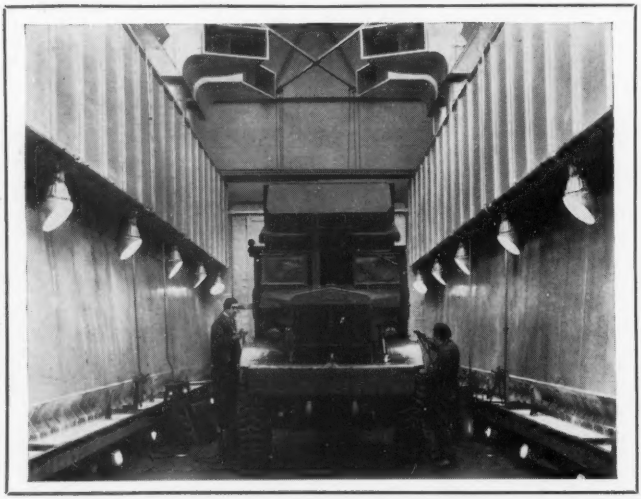
**No service can excel the A.I.D. INSTANT RESERVE REPLACEMENT SERVICE which ensures 100 per cent man-hour efficiency every hour of every day—NEW or reconditioned guns are exchanged instantly for your worn or damaged guns. A.I.D. not only supply guns, but EVERYTHING behind the gun. Whether your needs are large or small, do not hesitate to request the services of our technical organisation.**

## THE GUN AND EVERYTHING BEHIND THE GUN

**Sole Manufacturers: AIR INDUSTRIAL DEVELOPMENTS LIMITED, Aidspray Works, Shenstone, near Lichfield, Staffs., England. Phone: Shenstone 341/5. Grams: Aidspray, Shenstone. LONDON, 28 South Molton Street, W.1. Phone: Mayfair 6318 Grams: Aidspray, Wesdo.**

# Carrier

## INDUSTRIAL EQUIPMENT

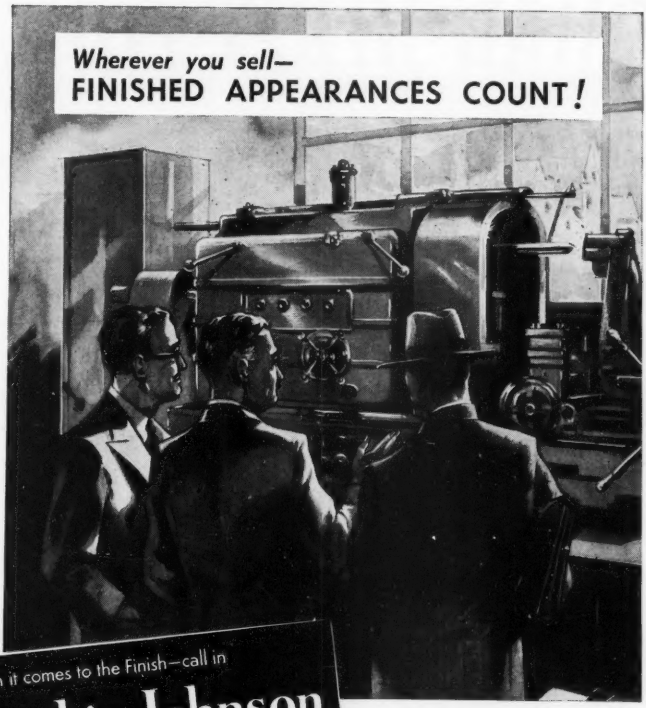


'Carrier' Water-Curtain Spray Booth for large road or rail vehicles.

(By courtesy of Messrs. Euclid (Great Britain) Ltd.)

**Carrier Engineering Company Ltd**

24 BUCKINGHAM GATE, WESTMINSTER, LONDON, S.W.1.




When it comes to the Finish—call in

# Pinchin Johnson

The Industrial Paints Service

4 CARLTON GARDENS
LONDON, S.W.1
Tel: TRAfalgar 5600

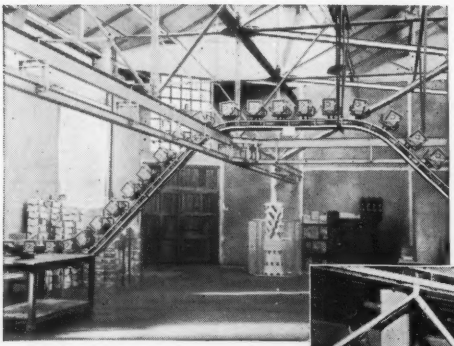
Whether you look to paint for its protective qualities, or whether its decorative merit is your criterion, a P.J. Paint Finish is the best for your product. The British Machine Tool Industry demonstrates that, with P.J. materials, a finish can be as attractive as it is durable.

**PRINCIPAL P.J. BRANCHES AND STOCK DEPOTS:**

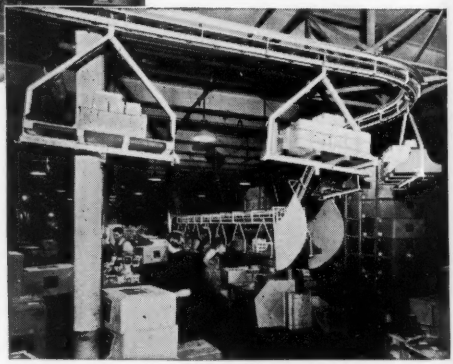
| | | | | |
|---|---|---|---|---|
| **BELFAST** ... ... ... | Dalton Buildings, Dalton Street ... ... | *Belfast* | *58643* |
| **BIRMINGHAM, 1** ... ... | King Edward's Place, Broad Street ... | *Midland* | *1042-3-4* |
| **BRIGHTON, 1** ... ... ... | 26 Elder Place ... ... ... ... | *Brighton* | *23739* |
| **BRISTOL, 1** ... ... ... | 37 Welsh Back ... ... ... ... | *Bristol* | *20765* |
| **GLASGOW** ... ... ... | Ocean Chambers, 190 West George Street | *Douglas* | *3281-2* |
| **LEEDS, 11** ... ... ... | 123 Water Lane ... ... ... ... | *Leeds* | *24377* |
| **LIVERPOOL, 20** ... ... | 72 Brewster Street ... ... ... ... | *Liverpool. Bootle* | *2121* |
| **MANCHESTER, 3** ... ... | 22 Bridge Street ... ... ... ... | *Blackfriars* | *3800* |
| **NEWCASTLE-ON-TYNE, 1** | Pudding Chare ... ... ... ... | *Newcastle-on-Tyne* | *21919* |
| **SOUTHAMPTON** ... ... | 41 Lower Canal Walk ... ... ... | *Southampton* | *3648* |

# DUAL-DIRECTIONAL

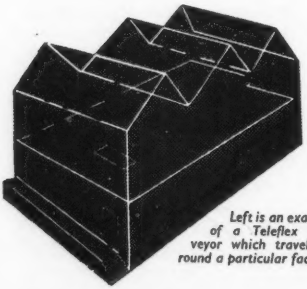
## CONVEYOR SYSTEMS



*Left: The Teleflex dua-directiona chain Conveyor adapted to carry tins of biscuits.*



*Right: Overhead chain conveyor carrying cigarettes in packing and despatch departments at the factory of Messrs. W. A. & A. C. Churchman.*



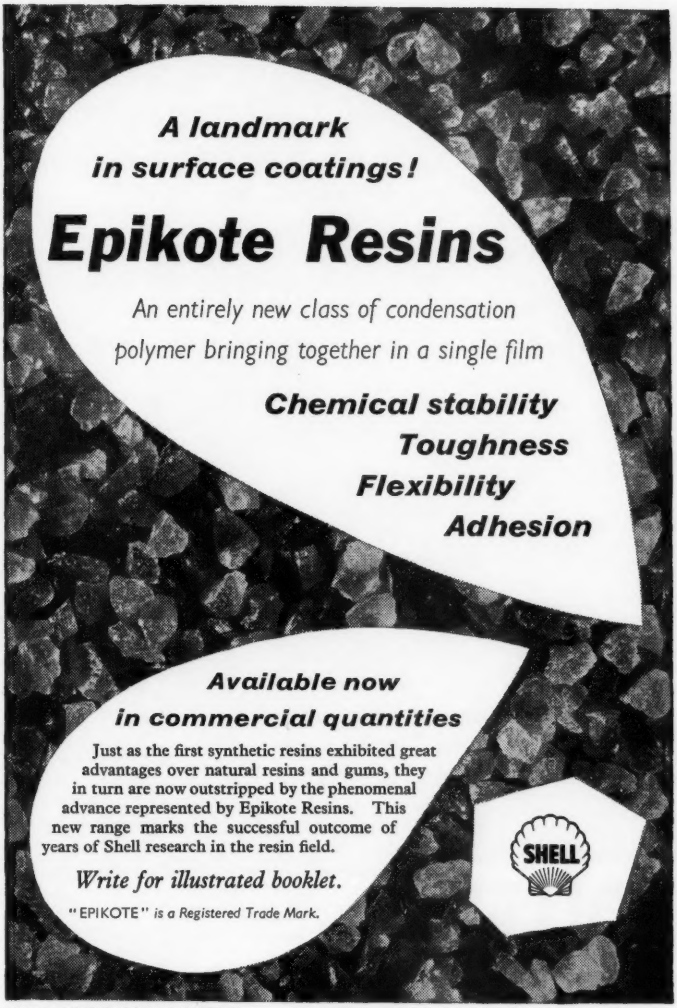
*Left is an example of a Teleflex Conveyor which travels all round a particular factory.*

Now thoroughly proved in service with some of the most well-known manufacturers the Teleflex Dual-directional Chain Conveyor can be supplied soon after receipt of your order. The design is simple, efficient, well proportioned and perfectly balanced.

Teleflex conveyor systems are constructed from standardised units which are capable of being formed into individual systems to suit any particular factory or production layout. Write for illustrated brochures:—Cable Conveyors ref.: CON. 1 I.F. and Chain Conveyor ref.: CON. 2 I.F.

**TELEFLEX PRODUCTS LTD · UPHALL RD. · ILFORD · ESSEX**

TELEPHONE ILFORD 3117


A landmark
in surface coatings!
Epikote Resins
An entirely new class of condensation
polymer bringing together in a single film
Chemical stability
Toughness
Flexibility
Adhesion
Available now
in commercial quantities
Just as the first synthetic resins exhibited great advantages over natural resins and gums, they in turn are now outstripped by the phenomenal advance represented by Epikote Resins. This new range marks the successful outcome of years of Shell research in the resin field.
Write for illustrated booklet.
"EPIKOTE" is a Registered Trade Mark.
SHELL

SHELL CHEMICALS LIMITED, (DISTRIBUTORS) Norman House, 105-109 Strand, London, W.C.2. *Temple Bar 4455.*

*Divisional Offices:* Walter House, Bedford Street, London, W.C.2. *Tel.: Temple Bar 4455.* 42 Deansgate, Manchester. *Tel.: Deansgate 6451.* Clarence Chambers, 39 Corporation Street, Birmingham 2. *Tel.: Midland 6954.* 28 St. Enoch Square, Glasgow, C.1. *Tel.: Glasgow Central 9561.* 53 Middle Abbey Street, Dublin. *Tel.: Dublin 45775.* 35-37 Boyne Square, Belfast. *Tel.: Belfast 20081.* Epls.c

Yes . . . we are specialists—specialists in degreasants and will diagnose all cases where inefficient degreasing has caused stripping and other finishing troubles. Let our Laboratory solve *your* particular problem and prescribe the correct grade of degreasant for your purpose.

**COLLEX**
**DEGREASANTS**

*Will banish any greasy deposit*

**B. H. CHEMICALS LTD.**

MERTON ABBEY LABORATORIES, ABBEY ROAD, LONDON, S.W.19 Phone: LIBerty 1021 (4 lines)

***Associated Companies:*** *Colloidal Detergents of Australia Ltd., Sydney, Australia: Chemical Services (Pty.) Ltd., Johannesburg. And at Copenhagen, Amsterdam, Brussels, Paris, Lille, Lyon and Ober-Winterthur, Switzerland.*

BHC COLLEX

# For a FINE FINISH

*— so essential to a fine product —*

*You need*

# MODERN STOVING & DRYING PLANT

Our extensive experience in the application, design and production of all types of OVENS—Stationary and Conveyor for all enamelling, lacquering, cellulose finishing and every drying operation by Convection and Infra-Red process—is freely at your service.

We also specialise in Dust Extraction Systems for Polishing and Grinding operations and Wood Working machinery, Fume Extraction and Ventilating Systems, Tanks for all Industrial Processes, Storage, etc.

Get in touch NOW.

*Telephone: Smethwick 1571-2-3-4*
*Telegrams: "Grifoven, Smethwick"*

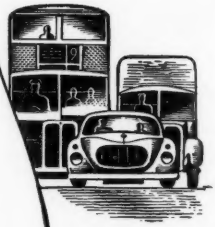
GRIFFITHS *the* SATISFACTORY PLANT

A.E. GRIFFITHS (SMETHWICK) LTD. BOOTH ST, HANDSWORTH, BIRMINGHAM

*Clinton-Wall*

*When I'm on duty things are under control*

*It's useful to have Mr. Therm on duty in the factory since there are so many processes he can control automatically for you. Gas-fired equipment is capable of the most accurate self-adjustment and the most rigid control of fuel consumption, while the flexibility of gas makes it adaptable to almost any process requiring heat. These advantages, coupled with its speed, cleanliness and economy, are every day adding to Mr. Therm's popularity in industry.*



MR. THERM HELPS IN INDUSTRIAL FINISHING

He makes himself very useful in vitreous enamelling, drying by natural or forced convection, radiant heat drying, paint curing and metal finishing of all kinds of articles.

*Mr. Therm burns to serve you*

THE GAS COUNCIL · 1 GROSVENOR PLACE · LONDON · SW1

# EFCOLENE

***for steel parts*** ... cleans thoroughly, consistently, is regarded by leading users of plating equipment as the best for the purpose.

**Good plating begins with**

***Efco-Udylite***
**CLEANERS**

# ZYCLENE

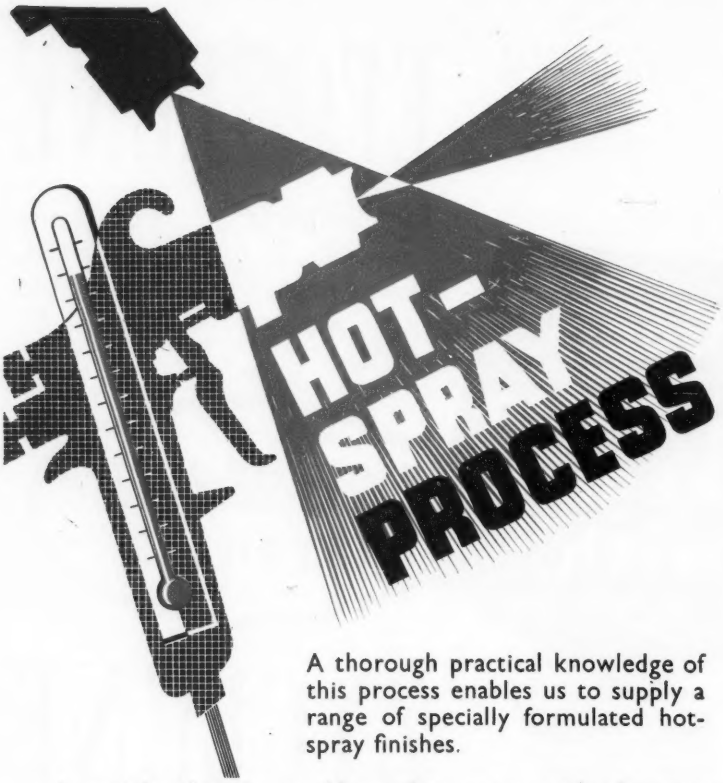
***for zinc base and brass parts***

Rapidly becoming the most widely used cleaner for zinc base alloy die-cast parts and for brass.

Easily controlled, these cleaners are acknowledged to be the most efficient and reliable available. They are used for soak cleaning and electrolytic cleaning and are suitable for barrel cleaning. Immediate delivery can be given ex-stock.

EFCO

**ELECTRO-CHEMICAL ENGINEERING CO. LTD**
Netherby, Queens Road, Weybridge, Surrey. *Weybridge 3891*
Associated with Electric Furnace Co. Ltd., Electric Resistance Furnace Co. Ltd.




A thorough practical knowledge of this process enables us to supply a range of specially formulated hot-spray finishes.

It may be that you could use this process with advantage and if you would like to know more about its possibilities, we will gladly send a senior member of our Technical Staff for consultation and arrange a demonstration at our works.

# THORNLEY & KNIGHT LTD

*Makers of Varnishes, Enamels, Paints and Lacquers*

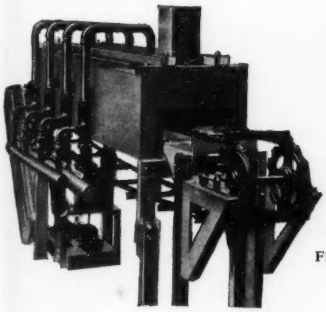
*SINCE 1797*

**BIRMINGHAM 9**

LONDON · MANCHESTER · NEWCASTLE-ON-TYNE

L.G.8

# INDUSTRIAL

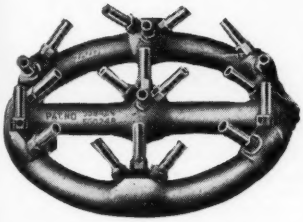


## Drying

Drying times are cut to 30 seconds in this **radiant heat** drying oven! Drying by radiant heat saves space and time—and reduces your gas consumption. There are radiant burners to fit **your** machines, cut **your** costs. Write for details today!

RADIANT HEAT DRYING FOR PAINT, TINNING BATHS, FLUORESCENT TUBE AND NEON TUBE BAKING ETC.

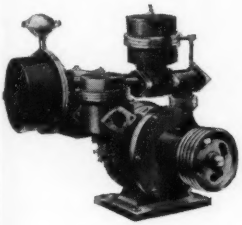
## Heating



For sterilisers, hot water and steam boilers, water tanks, etc.—there is no better gas burner than the DUOFLAM. The DUOFLAM gives you high-pressure heating from low-pressure mains—and there is a burner shape for every purpose.

Write for the illustrated DUOFLAM Reference book

## Gas & Air Mixing



The PREMIX Gas and Air Incorporator really gives you the maximum efficiency in Industrial heating. It compresses air and gas—in **any** desired proportion—into a thoroughly homogeneous mixture. A predetermined temperature can thus be maintained over very long periods.

COMPLETE COMBUSTION WITH NO WASTE PRODUCTS
NINE SIZES AVAILABLE

*We shall be pleased to advise you on any heating or drying problem*

50 YEARS CONTINUOUS SERVICE TO THE GAS INDUSTRY

**RADIANT HEATING LTD**

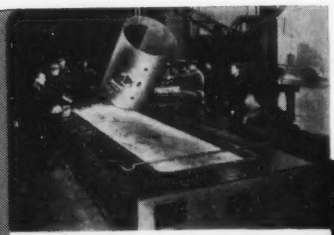
**RADIANT WORKS · BARNSBURY PARK · LONDON N.1** · *Tel.: North 1677 (3 lines)*

Automatic controlled

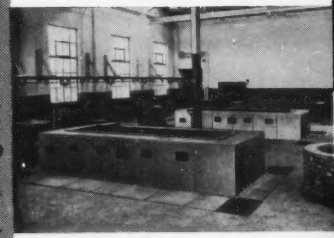
**GALVANIZING PLANT**

for all purposes

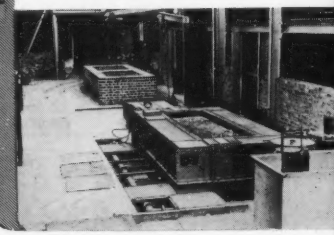
GAS FIRED PLANT



FOR GENERAL GALVANIZING



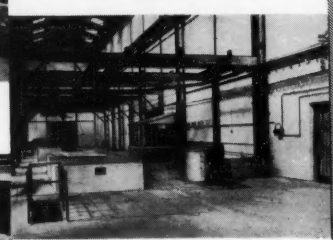
FOR BATCH PRODUCTION



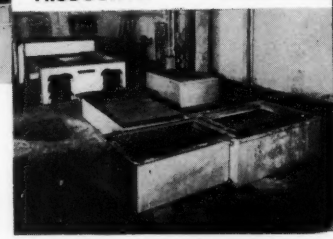
FOR RIVETS, BOLTS & NUTS

TB BILSTON

FOR LONG TUBES & SECTIONS



FOR SMALL WARE CONTINUOUS PRODUCTION



FOR HOLLOWARE

COAL FIRED PLANT

**Designs embody heating by Electricity, Gas, Oil or Coal. Our services include Consultations, Complete Plants, Baths, Furnaces and Auxiliaries.**

**THOMPSON BROTHERS (BILSTON) LTD**

BRADLEY ENGINEERING WORKS · BILSTON · STAFFS

TELEPHONE: BILSTON 41264-8 TELEGRAMS: THOMPBROS, BILSTON

LONDON OFFICE: ALDWYCH HOUSE · ALDWYCH · W.C.2 · TEL.: HOLBORN 1416

*When you see the*

**WHITES OF THEIR EYES . . .**

. . . you know they're looking at you—and if the people are important enough it pays to be on your mettle. And so must your product when prospective customers are looking—otherwise your competitors will steal the sale every time and your sales chart will begin to sag ominously. Remember, it's usually the *extra* quality such as a Cellon finish could impart to your product, that wins the customer's favour. When it comes to the finish the Cellon technicians are usually well on the target, as is evidenced by the wide variety of paints and finishes produced in the Cellon factories. For Wood Finishing — the superb Cerric range; for Transport, Building and Marine — the renowned Cerrux range. AND FOR INDUSTRY — specially formulated finishes by Cellon with carefully balanced drying schedules to meet the specialised requirements of mass production.

# CERRIC

INDUSTRIAL FINISHES

CELLON LIMITED · KINGSTON-ON-THAMES · PHONE: KINGSTON 1234

CVS-741-C

# Electrify production—

## use G.E.C.

## ELECTRIC Process Heating

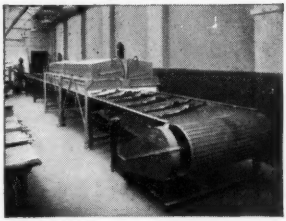
FURNACES · INFRA RED · HIGH FREQUENCY

● Bold thinking about bigger production demands new methods of heat treatment. G.E.C. *electric* process heating ensures maximum output and true economy. The many heating equipments in its range are clean, safe, simple to operate, and heat rapidly to constant correct and controlled temperatures. Its versatility is being proved every day.

● It has unlimited applications: from paint drying and stoving in light industry to bright annealing and brazing in heavy industry. For example, it is widely used for industrial finishing on all mass production lines.

● G.E.C. has had many years' experience in the design and construction of heating plant. The company's specialists welcome opportunities to discuss potential uses with engineers and metallurgists.

### Infra-Red Heating



*G.E.C. INFRA-RED LAMP PLANT*

The accelerated drying and stoving of synthetic resin and cellulose based finishes by infra-red heating reduces drying time from hours to minutes. Objects of all shapes and sizes are covered from refrigerators to powder compacts. Besides sheet metal work, it can be used for finishing wooden cabinets and furniture without causing blistering or distortion and with reduced sinkage. The finish may be pigmented or transparent, to show the natural beauty of veneers.

THE GENERAL ELECTRIC CO., LTD. MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

# Ask us HOW

**If your problem concerns Industrial Finishing—then you can ask us how and we'll give you every assistance from our technical department.**

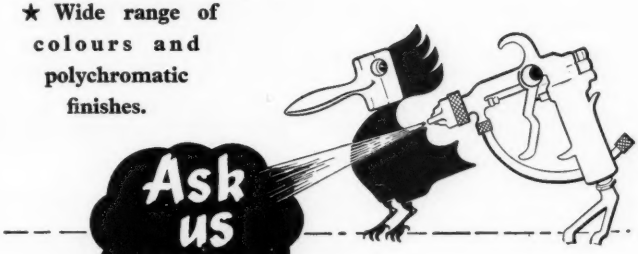
**Take Cadolex One as an example.**

**★ Mirror gloss. ★ Unsurpassed capacity and colour retention.**

**★ Good adhesion to difficult surfaces. ★ Mar-proof but flexible.**

**★ Stoves rapidly by convection or radiant heat.**

**★ Wide range of colours and polychromatic finishes.**



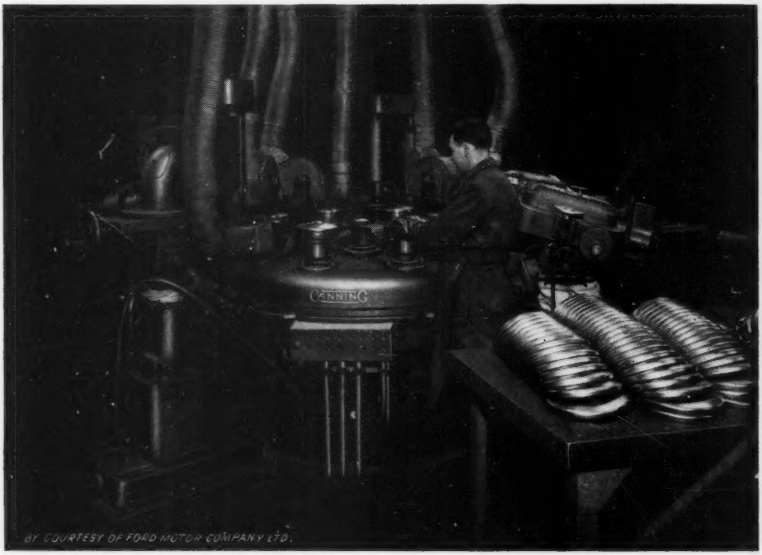

**Cox's INDUSTRIAL FINISHES**

COX BROS. & CO. (DERBY) LTD. Normanton Road, Derby. *Tel: Derby* 45484/5/6
P.B. Ex.

*EST.* 1781

CB3

# Another Polishing Problem . .

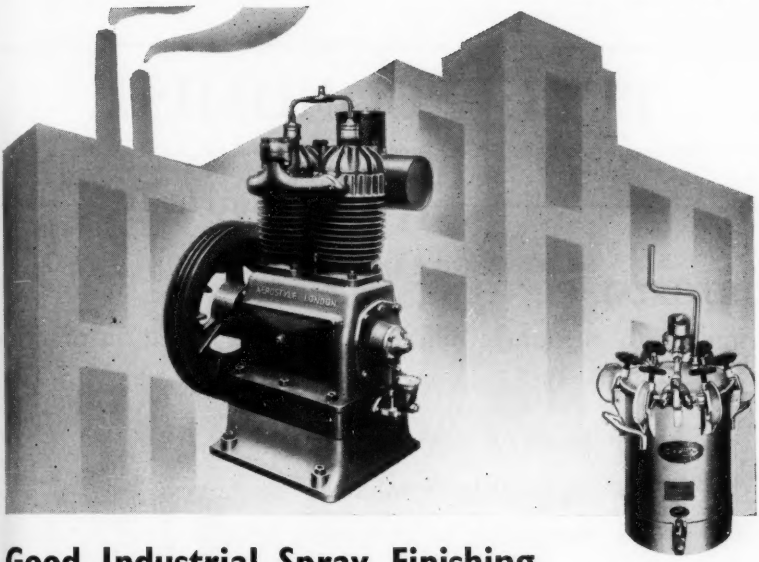



## Solved with CANNING
## ROTARY TABLE AUTOMATIC
## POLISHING MACHINES

Canning Continuous Rotating Table Polishing Machines can solve your polishing problem. They save labour, cut costs, increase production and represent the most efficient method of polishing articles ranging from pen caps to automobile wheel naves.

**Write for Leaflet No. 867B**

CANNING Birmingham . London and Sheffield




## Good Industrial Spray Finishing is now more vital than ever

With present day competition the importance of a good FINISH in producing and maintaining Sales can hardly be over estimated. Aerostyle Spray Equipment is designed for just this purpose—to produce a superb, durable finish, comparable with the finest brush work but at four or five times the speed.

We shall be pleased to forward full particulars of Spray Guns, Pressure Feed Containers and Portable or Stationary Compressors on request.

*Please ask for Illustrated Folder I-21F.*

# AEROSTYLE
## SPRAY EQUIPMENT

- We Specialise in constructing Water Wash Spray Booths to individual requirements.
- Aerostyle "After-Sales Service" is unsurpassed.

**Aerostyle Ltd. Head Office: 170/176 St. John Street, Clerkenwell, E.C.1**

***Telephone : CLErkenwell 5963 (4 lines)***

**BIRMINGHAM · GLASGOW · DUBLIN**

# FUEL ECONOMIST

EDITORIAL DIRECTOR: W. F. Coxon, M.Sc., Ph.D., F.R.I.C., F.I.M., M.Inst.F.

*quarterly*

## EDITORIAL CONTENT

Primarily to encourage efficient fuel usage based on practical considerations.

***KEY POINTS***

★ High efficiency solid fuel appliances.

★ Adaptation as to existing houses.

★ Economy benefits of correct insulation.

★ Parliamentary reports.

Coal, coke, smokeless fuels, gas, electricity, and oil are all covered —emphasis is on the user's needs.

## READERSHIP

Housing and factory architects; Local government Officers; Fuel engineers; builders' merchants; Government officials and informed public opinion. Manufacturers and distributors of fuel appliances and equipment used in fuel economy.

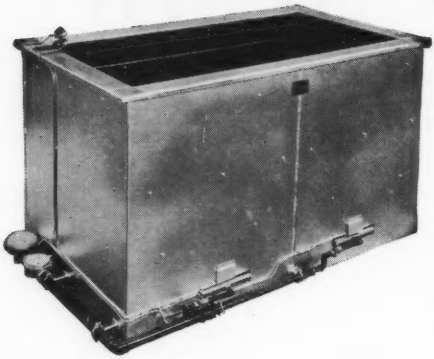
ARROW PRESS LTD., 157 HAGDEN LANE, WATFORD, Herts.
Phone: Gadebrook 2308 Grams: Techpress, Watford

***20/- per annum***

ARTHUR HOLDEN & SONS LIMITED

PAINT MANUFACTURERS • BORDESLEY GREEN • BIRMINGHAM 9

# The SPENCER gas-fired degreasing and washing-off TANKS



**for use with**
**ALKALINE DEGREASANTS**

Mild and stainless steel tanks of various designs made to suit most processes. Unit as illustrated designed for use with "SOLVEX" and "SEVERINE," manufactured by Messrs. FLETCHER MILLER LTD.

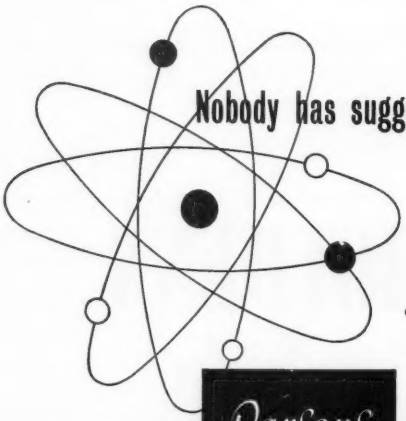
*For further details and advice please consult :—*

## NEIL & SPENCER LTD

**INDUSTRIAL PLANT DIVISION**

*Phone:* LEATHERHEAD 3451/2/3 • STATION ROAD, LEATHERHEAD, SURREY

---



## Nobody has suggested painting atoms... yet!

But, if anyone *did* want to paint atoms ours is the paint they would use for the job. We have, in our time, formulated paints for almost everything—from the bathroom scales to the ocean liner, or giant stratocruiser. Our research laboratories ensure that every finish we make is perfect for its purpose. Today paint is required for many purposes—and there is a PARSONS' PRODUCT for every one of them.

Parsons

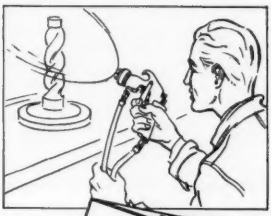
**THOS PARSONS AND SONS LIMITED**

70 Grosvenor Street, London, W.1. Telephone: MAYfair 7951
Branches: Beaconsfield, Birmingham, Brighton, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Manchester, Plymouth, Southampton

SPRAYLOGICS–the Facts of Spray Painting

# What is wrong with this picture?

There are no prizes for guessing. But the answers are worth a lot to everyone concerned with spray finishing, you'll find them and many others leading to improved quality of finishing and greatly increased production — in this new and exclusive DeVilbiss · Aerograph publication. Write for your copy to Dept. 21 S.

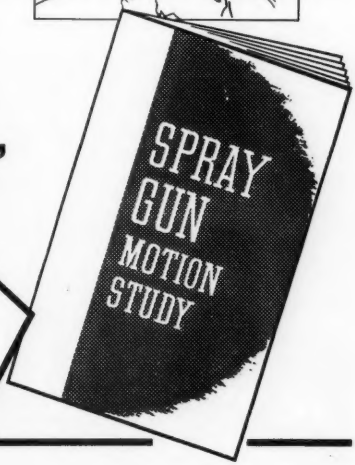


*Send for*

## 'SPRAY GUN MOTION STUDY'

(*No. 3 of a series*)

*Now ready — FREE!*




**TWO OTHER PRACTICAL GUIDES**

**which have already proved a boon to users of Spray Finishing**

**1. "A.B.C. of Spray Painting Equipment"**

Answers 144 questions on use, care and adjustment of spray finishing equipment.

**2. "Spray Gun Selection Guide"**

Guide to the right gun for every spray finishing need.

**Have you sent for your copies yet?**

**STILL AVAILABLE FREE ON REQUEST**

**DEVILBISS AEROGRAPH**

The SYMBOL of SERVICE

The Aerograph Co. Ltd.
Lower Sydenham, London, S.E.26

*Telephone: Sydenham 6060 (8 lines)*

*Branches and Showrooms:*
*London, Birmingham, Bristol, Glasgow, Manchester*

T.A. 5405

In 6 grades from soft to rock hard, and 4 qualities from medium grey to superfine, high-quality white, our range of polishing bobs includes the ideal wheel for every class of work. Send today for our free, illustrated brochure.

**COOPERS FELT**

*Please send all enquiries to:*

**Head Office & Works: Cooper & Co. (B'ham) Ltd., Brynmawr, Breconshire**
**Telephone: Brynmawr 312** **Telegrams: Felting Brynmawr**
Registered Office and Works: Little King Street, Birmingham 19

---

*In step with modern methods of Finishing*

*Our Laboratory-controlled Works are at your Disposal for . . .*

- **RAYGOLD**
- **BARREL CHROME**
- **ANODISING** (Sulphuric & Chromic)
- **HARD CHROME**
- **ROTO FINISHING**

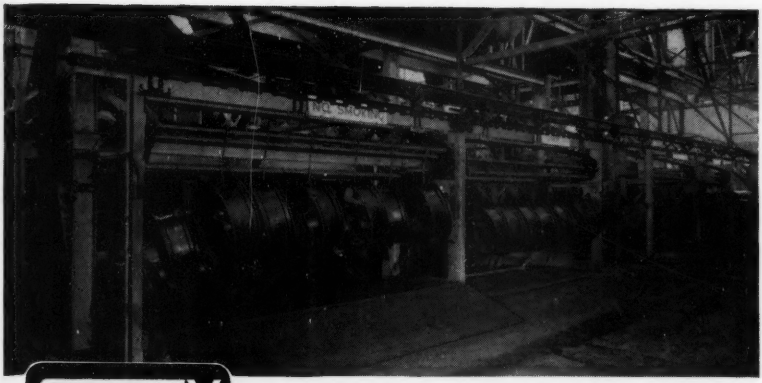
- Cadmium & Zinc Plating
- Barrel Plating
- Silver Plating
- Stove Enamelling
- Bright Nickel
- Chrome Plating etc.

Top Quality, Competitive Prices. Special Terms for quantities and contract work. A.I.D. approved.

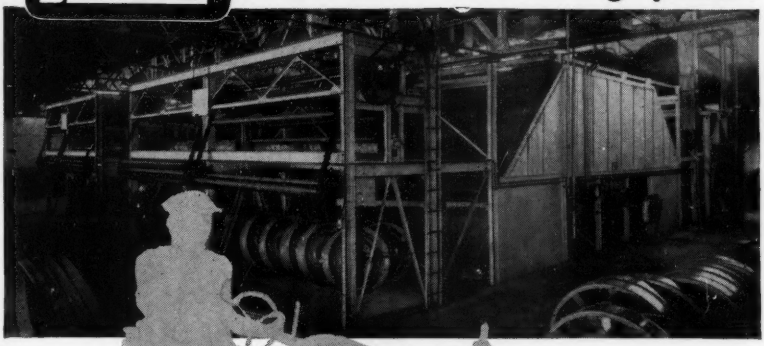
Collections and deliveries made in London or within any reasonable distance.

**Radiant METAL FINISHING CO. LTD.**

WELLCHROME WORKS, SHEPHERDESS WALK, LONDON, N.1 Phone: CLErkenwell 2527/8/9 Branches: Wenlock Rd. N.1, Hackney E.9



STORDY **modern finishing plant**



**This plant was designed for a fully mechanised dipping and stoving operation for Tractor wheels. Heating is by direct oil firing and the combined crossbar width of the two ovens is 42 ft. The installation included three paint storage tanks of 4,500 gallons capacity and two of 3,500 gallons capacity, together with paint circulating equipment. This is one example of a complete finishing scheme designed and engineered by Stordy . . . equipment is built for the complete cycle in the application of paints, varnishes and all metal finishes including pretreatment and mechanical handling.**
**Write for illustrated brochure.**

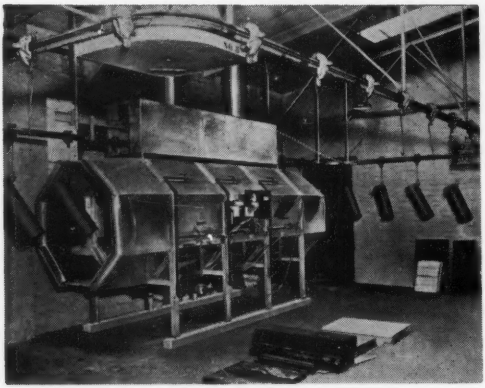
**STORDY ENGINEERING LTD**
CUMBRIA HOUSE GOLDTHORN HILL WOLVERHAMPTON

STORDY *thermal & mechanical engineers*

SMSR./166a

What's in a name?
. . . PRODUCTS THAT ARE WORTHY CARRY THEIR NAMES PROUDLY AND BEAR THE STAMP OF QUALITY . . .
KAYLEE
TRANSFERS
ARE WORTHY TO BRAND YOUR GOODS
Tell us your requirements—
KAYLEE TRANSFERS LIMITED
WEST END MILLS · LONG EATON · NOTTS
—Phone Long Eaton 692—
WEST WAY GARAGE
SKEGNESS
ESSO
DRINKS
CHAMBER OF COMMERCE
MEMBER
KAYLEE—The Hardest Wearing Transfers in the World

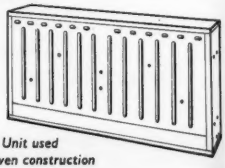
## To speed production—



A tunnel of Bratt Colbran Radiant Units stoving finishes on food canisters. (By courtesy of Messrs. Grundy (Teddington) Limited.)

## Bratt Colbran
### *INFRA-RED RADIANT UNITS*

With Britain calling for higher and higher productivity, Bratt Colbran gas-fired Radiant units are playing an increasingly important part in the industrial life of the nation. With their aid, drying and stoving times can be reckoned in minutes. Capable of dealing with parts of a wide range of sizes and shapes, these highly efficient units have already meant higher output with lower processing costs in scores of branches of industry.



*The Unit used in oven construction*

***Write for technical advice on installations to***

**BRATT COLBRAN LIMITED**

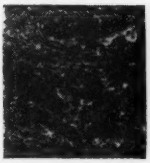
LANCELOT ROAD, WEMBLEY, MIDDX. Wem. 6221

## YOU EXPORT QUALITY, NOT RUST!

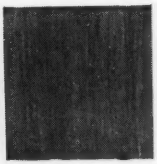
If you export machinery, tools or any metal products nothing is more important than their arrival condition. Expense and trouble in producing a high grade finish are negatived when goods are marred by rust or corrosion. Wherever your metal goods are bound, abroad or at home, complete protection is afforded by the RODOL series of rust preventives. There are eighteen standard products and between them, rust immunity is secured under most conditions of exposure, storage and use. This varies from brief interprocess protection to a guaranteed six months' life.

*SEE HOW RODOL PROVIDES REAL PROTECTION AGAINST RUST*

*These enlarged photographs of mild steel plates after exposure to the standard Humidity Conditions Test demonstrate the relative degrees of protection afforded by oil media in comparison with RODOL.*



*Heavy Petroleum Jelly—condition after 7 days, rust attack following original smear tracks.*



*RODOL W.S.—completely rust-free after 180 days, although plate was rough emeried at outset to accelerate possible rusting.*

**Protect it with RODOL**

**RUST PREVENTIVES**

*You are invited to avail yourself of the services of our technical department in any problem concerned with rust prevention or the overcoming of allied difficulties.*

FLETCHER MILLER

*Sole Manufacturers:*

**FLETCHER MILLER LTD**
**ALMA MILLS, HYDE, CHESHIRE**

Branch Works at LONDON, WEST BROMWICH & GLASGOW

FM 118/R4

## Pins and Paint?

**The production of protective and decorative coatings for the smaller necessities of life frequently presents more problems than the manufacture of finishes for goods of a more massive kind. Problems large or small are easily overcome and satisfactorily solved by using Kearsley *Specialised* Industrial Finishes —finishes which are specially designed to meet individual needs.**

*Hammer Finishes (Stoving and Air Drying)—Heat Resistant Enamels—Wrinkle Finishes.—Polychromatic and Flamboyant Finishes—Acid and Alkali Resistant Coatings—Hot Spray Finishes — Stoving and Air Drying materials.*

**Robert Kearsley & Co. RIPON — YORKS**

# Dawson METAL PARTS

## CLEANING & DEGREASING MACHINES

ensure the steady flow of production for the export and home markets. Doing the work of many hands in a fraction of the time, they are an important part of the equipment of all modern engineering works. The illustration above shows engine sumps being washed ready for final assembly. Dawson washing and degreasing machines are built to handle all sizes and shapes of metal components.

Used in all branches of Engineering

*Sole Distributors:*

**DRUMMOND-ASQUITH (SALES) LTD**
**KING EDWARD HOUSE, NEW STREET, BIRMINGHAM**
**Tel.: Midland 3431**
Manufacturers: DAWSON BROS. LTD., Gomersal, Leeds.
Tel.: Cleckheaton 1080 (5 lines).
London Works: 406 Roding Lane South, Woodford Green, Essex.
Tel.: Wanstead 7777 (4 lines).

EDITORIAL DIRECTOR:
DR. W. F. COXON,
M.Sc., F.R.I.C., M.Inst.F.

EDITOR:
W. J. ROBERTS

A monthly journal covering the whole range of finishing operations for wood, metals, plastics, etc.

Published Monthly
by
ARROW PRESS LTD.,
157 Hagden Lane,
Watford, Herts.

Price 2/6d. per copy.
0/- per year, payable in advance, which includes FREE issue of the Industrial Finishing Year Book.

# INDUSTRIAL FINISHING

(Incorporating "CORROSION")

## SEPTEMBER 1953

### FEATURE ARTICLES

| | Page |
|---|---|
| Do You Read Your Trade Journal? ... ... | 103 |
| Finishing Fluorescent Lighting Fittings, by G. S. Mogford, A.M.I.E.E., M.I.E.S. ... ... | 104 |
| Corrosion, Protection and Finishing of Copper and Its Alloys ... ... ... ... ... | 112 |
| "Industrial Finishing" Reports on the Engineering and Marine Exhibition ... ... | 118 |
| Decorative Processes—Part II, by J. H. Ousbey | 130 |
| Corrosion of Low Alloy Iron and Steel in Soils | 136 |

### MISCELLANEOUS

| | |
|---|---|
| Complete Cathodic Protection Service ... | 111 |
| Spray Gun Paint Strainer ... ... ... ... | 124 |
| Marking of Chemical Containers ... ... | 128 |
| Council of Industrial Design, Meeting ... | 128 |
| Reader Service Section ... ... | *facing page* 136 |
| American Finishing Developments ... ... | 142 |
| South African Finishing News ... ... ... | 146 |
| Names in the News ... ... ... ... | 148 |
| Advertisers' Index ... ... ... ... | 151 |
| Classified Advertisements ... ... ... | 151 |

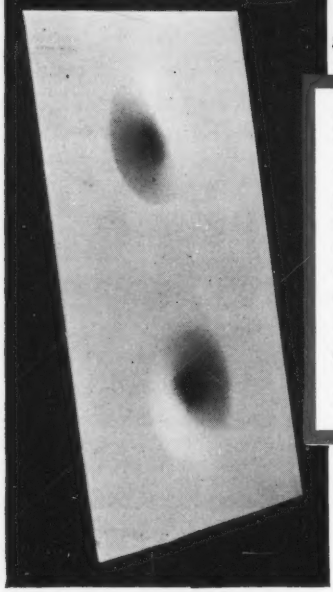
*Copy and Blocks should be available to us by 20th of the preceding month.*

*They should be sent to:*

INDUSTRIAL FINISHING
157 Hagden Lane, Watford, Herts.
Telephone: Gadebrook 2308/9

# HARD but ELASTIC

*Amazing NEW ONE COAT Finish!*



*Untouched photograph*

ERICHSEN PRESSURE TEST:
The steel plate illustrated is coated with Group 28 Stoving Finish. The plate was subjected to pressure from a steel ball on one side of the plate and a brass cup on the other. The depth of the depressions is $\frac{3}{8}$". *No film fracture whatever occurs—and yet it will withstand a scratch test in excess of 1,500 grammes.*
We will gladly send you a panel for your inspection.

This finish is exceptionally resistant to chemical action which makes it perfect for coating articles that come in contact with acids and alkalis. Its outstanding adhesive properties make priming coats unnecessary with most metals.

## GROUP 28

## International Stoving Finish

*Based on "Epikote" resin.*

# International Paints Ltd.

Head Office: **GROSVENOR GARDENS HOUSE, LONDON, S.W.1.**
*TELEPHONE: VICTORIA 3161 (10 LINES)* *TELEGRAMS: CORROFOIL, SOWEST, LONDON*
**Branches at: Cardiff, Glasgow, Hull, Liverpool, London, Newcastle, Southampton, West Hartlepool.**

REGISTERED TRADE MARK

MAIN FACTORY IN U.K. FELLING-ON-TYNE

*ASSOCIATED FACTORIES AT*

| | | | | | |
|---|---|---|---|---|---|
| BERGEN | NORWAY | KOBE | JAPAN | SAN FRANCISCO | U.S.A. |
| BILBAO | SPAIN | LE HAVRE | FRANCE | SYDNEY | AUSTRALIA |
| COPENHAGEN | DENMARK | MEXICO CITY | MEXICO | TRIESTE | ITALY |
| GENOA | ITALY | MONTREAL | CANADA | VANCOUVER | CANADA |
| GOTHENBURG | SWEDEN | NEW YORK | U.S.A. | WELLINGTON | NEW ZEALAND |
| HAMBURG | GERMANY | RIO DE JANEIRO | BRAZIL | | |

Industrial Finishing

VOL. 6 SEPTEMBER, 1953 NO. 63

## DO YOU READ YOUR TRADE JOURNAL ?

DO you read your trade journal? Most business men read one or two daily papers, a Sunday paper and probably a weekly hobby or general magazine, yet few spare time for more than a quick flick through their trade journal. It seems they must keep up-to-date with the news and political opinion but, where trade developments, informed trade opinion and inventions and innovations in their trade are concerned, they rely on the sales talk of travellers or the odd word let fall by their trade acquaintances.

To do business effectively a man must be provided with the tools of his trade; must watch rising material prices, new plant and equipment, rising and falling trends in the sale of his particular line of goods, changes in style and finish of competitors' products. All this and more besides, he can get much more adequately from his trade journal than from the miscellaneous sources mentioned earlier.

If he stops at merely *reading* his trade journal, he is liable to miss much of value. The trade journal, if it is doing its job properly, carries notices of meetings where trade topics are discussed, notices of the introduction of new catalogues and lists, notices of the movements of personalities within trade circles. All this information is of potential value and can be used to advantage if it is read in time. Alas! only too often do we hear from executives that their copy of INDUSTRIAL FINISHING or some other journal only reaches them after lying round the offices of the firm for days or even weeks; by the time it gets to the man who could use the information, the event has passed, the demonstration is over or the offer is closed; alternatively, there is not sufficient time left for him to arrange his affairs in order to attend.

In many of the offices we visit, trade journals are to be seen piled up in corners instead of out in the various departments doing their job. They have been put aside "in case they contain something of interest" instead of being passed on to other executives in the firm; how that "something of interest" is ever to be found is quite another matter and the accumulation is soon such as to discourage the stoutest heart from going through them and the pile is "dumped." What is the solution to these problems?

There are three things every reader of trade journals *must* do if he is to get adequate value from them. First, a quick run through each journal on the day it arrives, then let it go out to other people to do its job. You can always mark it for return to you later or, alternatively, extract the interesting pages before it goes out. Second: find out if you have enough interested readers to justify more than one subscription; a single subscription is rarely enough for a large firm: it invariably means that someone has to wait till the journal is out of date before he gets it. Third, find out if your trade journal runs an information or reader service section and learn how to make use of it. Most authoritative journals run such a service and the knowledge and experience of an army of experts and a specialised library are available in this way if you need them.

# The Finishing of Fluorescent Lighting Fittings

**Describing the methods, plant and equipment used in the Doncaster works of Crompton, Parkinson Ltd., by G. S. H. Mogford, A.M.I.E.E., registered lighting engineer (I.E.S.).**

PRIOR to the advent of the fluorescent tube the high temperature of the lamp was the criterion in the selection of reflector finishes and for this reason vitreous enamel had established itself as the pre-eminent finishing medium for general purpose lighting fittings. Prismatic or silvered glass, and anodised aluminium were used to a lesser degree, usually when some definite control of the light flux was required.

The introduction of the fluorescent tube, with its inherently low temperature and long length, created a problem for fittings designers and manufacturers in the selection of a suitable reflector finish. Glass was obviously unsuitable due to weight and strength considerations and, whilst suitable in many ways, anodised aluminium proved to be too expensive for general use. Although vitreous enamel was to be desired for its durable reflecting surface, the long trough-like reflector presented many problems for the limited manufacturing facilities which were available at the time. Also the cost was far higher than could be economically justified.

**Air Drying v. Stoving**

In order to meet the urgent needs of war production, manufacturers investigated the use of both air drying and stoving enamels. Air drying enamels were rejected due to their lack of permanency, and in particular the yellowing which occurred in service. Investigations on stoved enamel finishes proved more successful, as it was found that this finishing method offered a reasonable compromise between all round efficiency and practical manufacturing considerations. As a result the majority of industrial type fittings produced during the war years were of sheet steel with stoved enamel finishes.

As was to be expected, the application of, what was to the fittings trade, a new finishing method, was not without its teething troubles, and a combination of substitute materials in the enamels, limited facilities, and a lack of appreciation of the finer points of pre-treatment and finishing, led to results which, in some cases, failed to meet the onerous conditions to which lighting fittings are subjected.

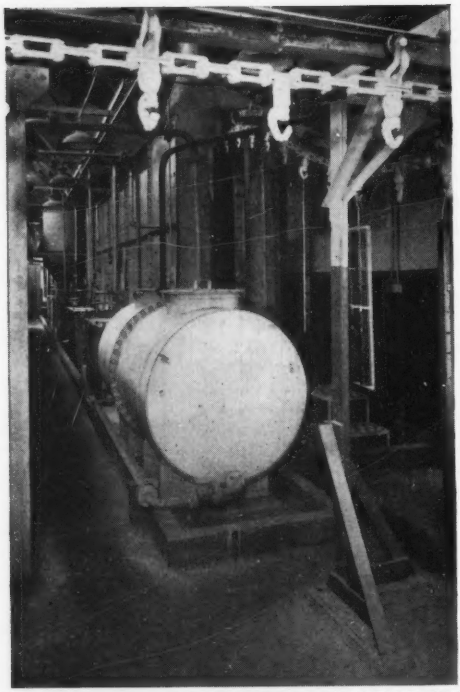
The experience so gained, coupled with important improvements in quality, enabled stove enamel finishing to hold its own in direct competition with the other finishes and there is no doubt that it is now firmly established as an efficient method for fluorescent lighting equipment.

The improvement in quality which has been achieved lies not only in the formulation of new enamels and the ready availability of the correct ingredients for these enamels, but also in the attention given to the day to day production difficulties which so often make the difference between a good and a bad finish.

In planning their new fittings works at Doncaster, Messrs. Crompton Parkinson had available a wealth of experience covering both manufacturing and service problems, and every endeavour was made to ensure that the plant would be capable of producing a finish of the highest quality.

Prior to the installation of the plant Crompton Parkinson engineers inspected a number of finishing shops in this country and also in the U.S.A. with the result that the installation

## FLOOR PLAN OF C.P. FINISHING DEPT. AT DONCASTER



Left: Parts entering the Bonderizing tunnel. Bonderite bulk storage tank shown in foreground. Liquid is pumped from this to the daily service tank which can be seen on the left of the conical sludge settling tank

Below: On leaving the dry-off oven the parts are tack-ragged in this area before entering the primer booth shown on the right of the photograph

incorporates all the latest ideas and the most modern apparatus available.

One of the main features of the plant is that, as far as possible, variable factors have been eliminated; the processes being controlled automatically, rather than by hand. Where this is not possible, continuous inspection is applied to maintain quality standards.

The plant was designed and installed by Heat and Air Systems Ltd., who worked in close collaboration with Crompton Parkinson engineers throughout the contract.

In order to make the plant as automatic as possible, a continuous overhead conveyor system was decided upon. A 740 ft. long conveyor running at 4·3 ft. per min. passes through the fifteen process stations. Once a part is loaded onto the conveyor, it goes through a pre-set schedule of operations without having to be off loaded until it is finally inspected at the unload point.

**Cleaning and Pre-treatment**

Special attention was given to the efficiency of the cleaning section and a five stage Spra-Bonderite installation was decided upon. The long narrow shape of the main items being processed, lends itself to the spray method of cleaning and pre-treatment and its adoption ensures that every part is given individual treatment and is adequately covered with 'live' liquid. The actual Bonderite tunnel is raised above floor level, and the various chemical and rinse tanks placed underneath on the floor. Each tank is steam heated and thermostatically controlled and, in addition, temperature recorders are installed for technical control purposes. Chemical tests are made three times during the normal working day, and in addition the rinse tanks are operated on a generous over-flow basis to avoid any contamination from chemicals which may be carried over from other sections.

Interzone wetting sprays are installed to prevent the parts drying off between each stage, these sprays being bled off from the main stand pipes inside the tunnel.

Operating temperatures of the five stages are as follows:—

| | |
|---|---|
| 1. Pyroclean | 180° F. |
| 2. Hot Water Rinse | 160° F. |
| 3. Bonderite | 170° F. |
| 4. Hot Water Rinse | 150° F. |
| 5. Hot Water plus Chromic Acid Rinse | 170° F. |

In the Bonderite section, which is fully protected by rubber lining, a sludge settling tank is incorporated, the Bonderite liquid being pumped into this tank every evening and the sludge settled out over night.

The installation includes a bulk Bonderite tank which enables the chemical to be delivered by tanker, thus saving the handling of unwieldy barrels. From the bulk storage the liquid is pumped to a small daily service tank. It is then fed, by gravity, to the operating tank.

Leaving the Bonderite tunnel the parts pass through a gas fired dry-off oven. Here, again, the temperature is closely controlled to ensure that all trace of moisture is removed, particular attention being paid to any partially closed seams or joints which are liable to act as traps. The oven is operated at 250° F. and the parts take 7 min. to travel the 30 ft. length.

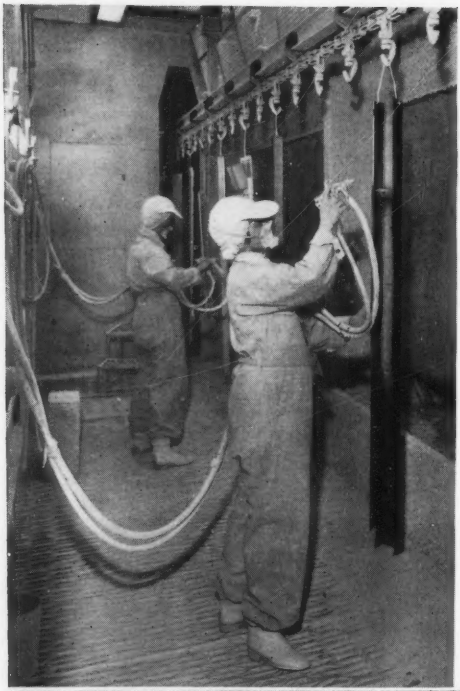
The dry-off in common with all other ovens, is fitted with air seals at both entry and exit ends. These provide a 'curtain' of air and reduce the heat losses from the otherwise open ends of the ovens.

On leaving the dry-off oven, the parts are inspected and rubbed down with tack rags to remove any excess phosphate coating, or dust particles. The parts are chemically inspected at this stage and anything which has not been adequately cleaned, or pre-treated is rejected and returned for special treatment.

**Synthetic Primer Application**

The parts then pass through a 12 ft. long water wash spray booth, where the synthetic stoving primer is applied by means of standard production type guns.

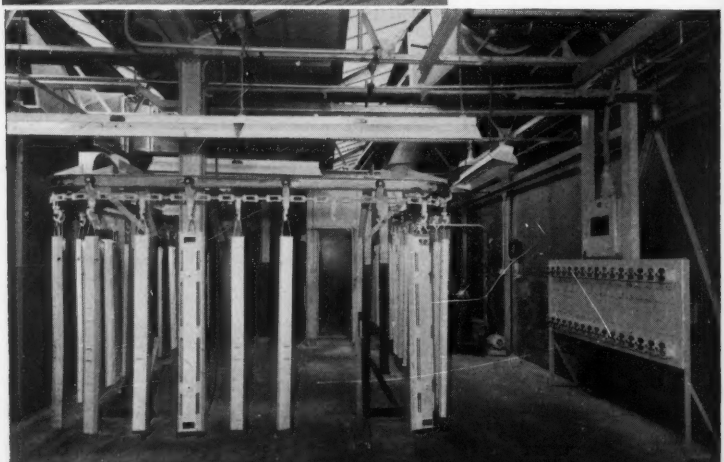
At the exit end of the primer booth, there is a flash-off tunnel connecting the booth to the primer bake oven. The gas fired primer bake oven is operated at a temperature of 240° F.,

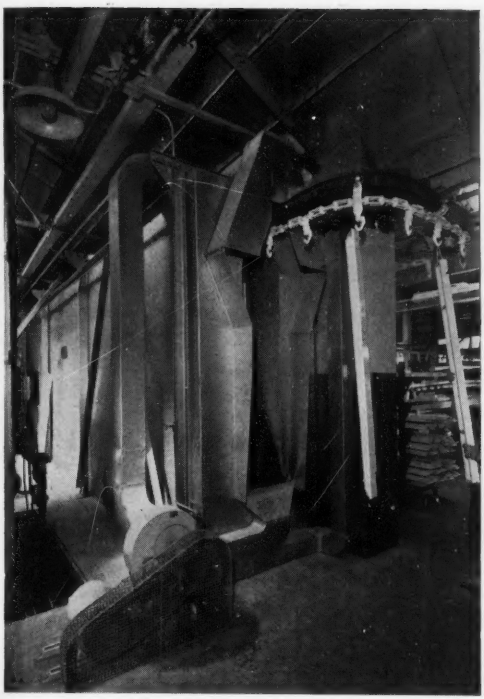


*Left: Girl operators applying the first coat of synthetic primer in the 24 ft. long water wash back primer booth*

*Right: Exit from the steam heated final oven. This view shows one of the air seals used to prevent the escape ... of heat from the ovens*

*Below: On leaving the primer bake oven the articles are inspected and where necessary rubbed down before entering the final booth. The master switch panel on the right controls all the motors in the plant*





and the parts pass through the oven in 25 min.

Temperature is thermostatically controlled and special care was taken in the design and the initial setting up of the oven to make certain that local hot spots were avoided.

The hot air from the gas fired heater is circulated by means of ducts inside the oven, and is distributed in such a way that the whole of the articles being processed are uniformly heated, thus ensuring correct curing of the primer.

On leaving the primer bake oven, the parts are inspected for any blemishes and minor faults are corrected by rubbing down with wet and dry paper whilst the parts travel on the conveyor.

The final coat of high gloss Crompton "Permawhite" enamel is applied in the final booth, and in this case, Aerograph hot spray units are used.

Hot spray enamels were decided upon after extensive tests as they provide a finish having excellent surface characteristics, and at the same time reduce rejects, due to sagging, and similar faults, to a low level as compared with normai solvent thinned enamel.

A second flash-off tunnel precedes the entry into the final bake oven, which is steam heated. The steam heating arrangement is by gilled pipes and is operated at 100 lb. per sq. in.

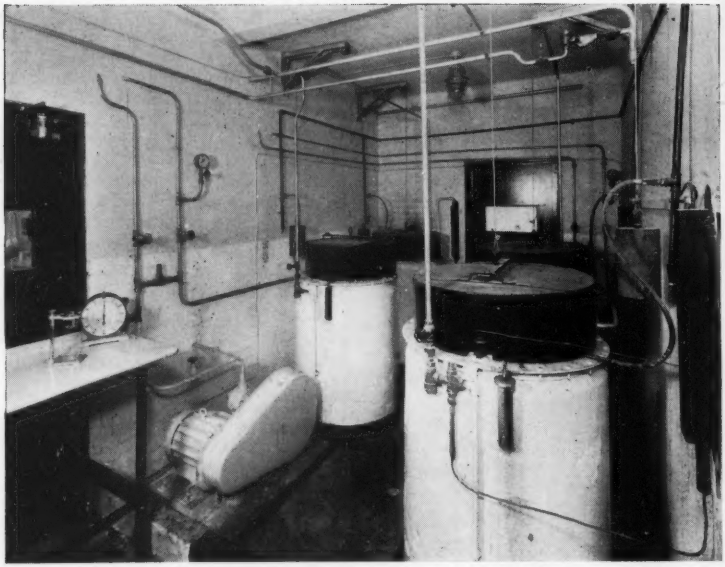
The heating units are located at the bottom of the oven and are split into three sections along its length; temperature is graded in these three sections to match precisely the the characteristics of the enamel.

Stoving is carried out for 30 min., the temperature being 260° F. over the main sections of the oven.

The use of steam as a heating agent was based on the need to obtain the highest possible gloss and a pure white finish. It was felt that gas firing had disadvantages in this direction due to the possibility of the products of combustion contaminating the heated air, plus the fact that the air movement would lead to dust particles reaching the painted products.

On leaving the final oven, a further inspection is carried out to make absolutely certain that the material passed to the assembly conveyors is of the very best quality.

A rather unique feature for a plant of this size is the central paint mixing room. This was decided upon, in preference to the normal pressure pots in the booths, as it enables the paint mixing to be closely controlled. By making one person responsible for the mixing, instead of individual sprayers, a variety of mixtures is avoided and a uniformly high quality obtained.



Above: Paint mixing room, paint is taken from the 50 gal. mixing tank and pumped through a ring main to the spray booths. Below: Part of the final assembly line for fluorescent lighting fittings

The installation in the paint mixing room consists of four 50 gal. mixing pots fitted with air driven agitators. Two of the pots are for the primer and two for the final enamel. One pot per section is used while the other is being cleaned or filled ready to take over when the pot which is operating is emptied. The pots are water jacketed, fitted with steam coils and thermostats and are maintained at a temperature of 80° F. This pre-heating of the enamel avoids the difficulty normally experienced with fluctuating ambient temperatures. With a constant operating temperature, differences in ambient are not reflected in variations in viscosity of the enamels.

Paint is pumped out to the spray booths through a copper piped ring main by means of Wayne pumps.

Paint filters are installed in the lines, both for the outgoing and incoming liquid.

For the general spray shop, make-up air to replace that exhausted via the spray booths is provided through six units, these being fitted with filters to absorb any atmospheric pollution or wind-borne seeds.

Steam heated radiators are also fitted in the make-up units for space heating purposes during winter months.

The control of all the motors in the plant is centralised on a master control panel and, where processes are interdependent, the starters are wired in such a way that, should a failure occur on any one motor, all the motors in the section will be cut out.

Supplementing the individual inspection of each part as it comes from the finishing line, is a system of daily checks on test panels. These test panels are put through the plant at specified times in the morning and afternoon, and receive normal treatment. They are then aged for 24 hours and subjected to a series of tests including reflection factor, hardness, adhesion, bend, impact, etc., followed by a week's tropical condition tests and ultra-violet exposure. By this means any minor change is quickly noted and remedied on the line.

---

## Complete Cathodic Protection Service

CATHODIC protection is a new approach to the problem of fighting the corrosion of ferrous plant and equipment and is particularly valuable in the case of buried or submerged structures where normal maintenance may be difficult or impossible. Its increasing acceptance as a standard practice by many large companies in different branches of engineering is an indication of its "rightness" and its efficiency.

The principles involved, whilst scientific, are simple but the successful application of these to modern industrial needs can only result from accumulated experience and research. This is one of the main reasons that has prompted F. A. Hughes and Westinghouse, specialists in this new field, to pool their technical resources and to offer their combined technique to industry in the form of Guardion Service. This Service comprises a supply of Guardion and Westalite Cathodic Protection equipment, full consultative and design facilities, together with appropriate surveys and site investigation. It thus provides everything required for complete schemes of Cathodic Protection either by means of reactive anodes, which are independent of external power sources, or by applied current using energy from mains supply.

Both the methods mentioned have their particular spheres of usefulness depending on a number of factors. Protection by means of galvanic or reactive anodes operates on the principle of preventing corrosion at the lesser expense of replaceable anodes. These anodes, of a special magnesium alloy, are connected to the structure to form a primary cell, the electrolyte consisting of the earth or water in which the structure is positioned. The arrangement is such that the current, which is self-generated, leaves the metallic circuit via the anodes to the electrolyte, rendering the structure cathodic and thus incapable of corroding, whilst the anodes are gradually consumed in the process. Polarisation of the structure slowly takes place, restricting the current flow thereby and reducing the rate of anode consumption. Magnesium is chosen for such reactive anodes because it combines a high potential with freedom from polarisation and at the same time is economical in use. Special alloys are used, calculated to give maximum efficiency with long life.

In some applications and where the resistance of the electrolyte reaches high values, it becomes advantageous or necessary to apply a potential greater than can be provided by magnesium. The applied current method is then used and the anodes in this case are made of inert material such as graphite which is not consumed. The current required for the process is provided from mains supply by means of "Westalite" rectifiers. These are available for operation from either single- or three-phase supply and for either indoor or outdoor installations. Automatic or manual control of output can be provided.

Guardion Cathodic Protection is being used throughout the world on oil, gas and water pipe lines, water storage tanks, ships bottoms, cast-iron ships propellers, floating docks, steel piling, mooring buoys and cable sheathing—to name but some of its applications. Further details of the complete Guardion Service can be obtained from F. A. Hughes and Co. Ltd., Cathodic Protection Division, Bath House, 82 Piccadilly, London, W.1.

# Corrosion, Protection and Finishing of Copper and its Alloys

**Some points from the C.D.A. Technical Survey**

TWICE each year, in January and again in July, The Copper Development Association publish a review of recent technical developments in the production, distribution and usage of copper and its alloys. This review is enhanced by the inclusion of a complete biography and each issue usually contains much information of value to the finishing shop and the corrosion student.

A copy is sent free of charge to anyone interested and those wishing to take advantage of this offer should write to the Association at Kendals Hall, Radlett, Herts, asking for their names to be added to the mailing list. The following is an extract from the section of the current issue, concerned with finishing, plating and protection from corrosion, together with the appropriate bibliographical references.

White brass plating has lately aroused considerable interest, especially as an undercoat for chromium. In a brief but critical review of its possibilities, Saltonstall (1) points out that, while little trouble is experienced in producing bright coatings, the high zinc alloy deposited is not particularly resistant to corrosion in outdoor conditions, or even indoors if the environment is moist. Moreover, the deposit is normally in a highly stressed, brittle condition and tends to crack if its thickness is increased beyond about 0·0003 in. Cracking is aggravated if a stressed chromium deposit is superimposed upon the white brass and for this reason chromium deposits thick enough to afford complete protection from corrosion cannot be applied. Nickel is undoubtedly to be preferred, though white brass has distinct advantages for certain purposes, for example, in the finishing of zinc-base die-cast toys, where contamination of the nickel bath by zinc might lead to plating difficulties. Binai (2) has described a method of maintaining the copper content of white brass plating solutions by means of an electrolytic regenerating technique.

A new fast process for the electrotinning of copper wire (3) is said to achieve speeds up to 600 ft./min. on 18 s.w.g. wire, using a tank 20 ft. in length. Operating at 200°F. with a current density of about 560 amps. sq./ft., tin thicknesses of about 0·00002 are obtainable at the speed mentioned.

Another interesting development is the manufacture of metallic mesh by electrodeposition (4) in a manner which appears to be essentially different from the technique of electrodepositing metals upon fabric meshes mentioned in the previous survey. Nickel-coated copper mesh is available among other types.

Heritage and Balmer (5) have reviewed the techniques of metallising glass, ceramics, plastics and similar non-metallic surfaces, while Narcus (6) has patented a process for carrying out such operations, using the fluoborate of the metal, for example, copper, to be deposited.

Able descriptions of the principles and practice of the mechanical surface finishing of metals have been published by Colegate (7) and Mable (8) while Sawyer (9) has reviewed the literature of surface finishing which has appeared since 1945. According to Kaurat (10), a bath suitable for the electropolishing of small pressed brass parts consists of a mixture of phosphoric acid, glycerol, ethylene glycol, lactic acid and water, with additions of glutamic acid or monosodium glutamate if a mirror finish is desired.

## Corrosion and Protection

As the result of a review of the available information on the stress corrosion cracking of brass, de Jager (11) reaches conclusions which are broadly in accord with the trend of modern thought. He does, however, depart from practice in this country by re-

commending the addition of 1·5 per cent of silicon as a protection against stress corrosion cracking, and emphasises that the grain size should be kept small. Bailey (12) has published the results of stress corrosion tests on a range of cast high tensile brasses of *beta* structure, with various contents of aluminium, manganese, iron, tin and nickel adjusted so that all the materials had approximately the same tensile properties. He pronounced aluminium contents exceeding about 2 per cent to be undesirable in cast high tensile *beta* brasses, as they induce a form of latent intercrystalline brittleness which is subject to aggravation by corrosive agencies, such as sodium chloride solution or sea water. He also observed that the co-presence of iron and manganese in *beta* brasses containing aluminium tends to reduce susceptibility to weakness. Experiments directed towards combating the intercrystalline weakness of cast *beta* brasses containing aluminium have led the British Non-Ferrous Metals Research Association to patent the addition of from 0·01 to 0·5 per cent of titanium or zirconium (13) for this purpose. The patent is the result of tests based on theoretical conceptions concerning the behaviour of atoms of foreign elements at the grain boundaries of brass. Hannon (14) has examined the relative merits of different metallic coatings as a protection against stress corrosion, the basis material being an alloy consisting of copper 91, aluminium 7 and silicon 2 per cent. He found that coatings containing tin, whether electrodeposited or flowed-on, gave better protection against cracking in mercurous nitrate solution than any other coating tried. This was attributed to a reaction between the tin and the mercurous nitrate, giving rise to a sponge-like product which prevents deposition of mercury on the surface of the basis metal. Protection against mercury is of much less practical significance than protection against ammonia, for it is the latter which is the active agent in most stress-corrosion failures. Hannon found, however, that electrodeposited tin, like other electrodeposited coatings, was ineffective against ammonia, whereas a flowed-on layer of tin diminished the attack. He ascribed this to the relative imperviousness of the flowed layer rather than to the chemical nature of the tin. It should be remembered, however, that the temperature necessary to melt the tin would tend to relieve any internal stresses which might be present, and so to mitigate stress corrosion, quite apart from the effect of the tin as a protective coating.

Two reports of extensive field trials of specimens immersed in sea water (15) and buried in five different soils (16) respectively have become available. The first of these published by the International Nickel Co. deals, among other matters, with the effect of additions of zinc, iron, manganese, tin, chromium and arsenic on the resistance of 70:30 cupro-nickel to marine corrosion. While most of these additions proved to be harmless, or even beneficial, it was found that zinc tended to aggravate pitting of alloys containing iron, and it was consequently recommended that the zinc content of iron-bearing cupro-nickel should be restricted to a maximum of 0·5 per cent. The paper on soil corrosion forms part of a symposium organised by the Iron and Steel Institute. Specimens of copper, aluminium and lead were buried at five different sites in salt marsh, London Clay, moist natural clay, Keuper Marl and cinders respectively. All three metals were corroded by the cinders, but in the other soils copper proved to be far superior to aluminium, and in most cases also to lead.

Several years ago Ingleson, Sage and Wilkinson (17) examined the effect of chlorination of drinking water on the corrosion of brass water fittings, and showed that chlorination was not particularly detrimental to cast leaded *alpha* brasses though it tended to increase dezincification in the case of wrought *alpha* plus *beta* alloys. More recently Wormwell and Nurse (18) have reported on a parallel series of tests carried out by the Chemical Research Laboratory, Teddington, at the same time as the work of Ingleson and his collaborators. Both 60:40 brass and mild steel were used for the experiments and a special apparatus was devised to control the flow of water across the specimens at a constant rate. The brass corroded very much less rapidly than the steel. The effect of chlorination varied with the type of water. In several waters chlorination had no definite influence; in some there was a dis-

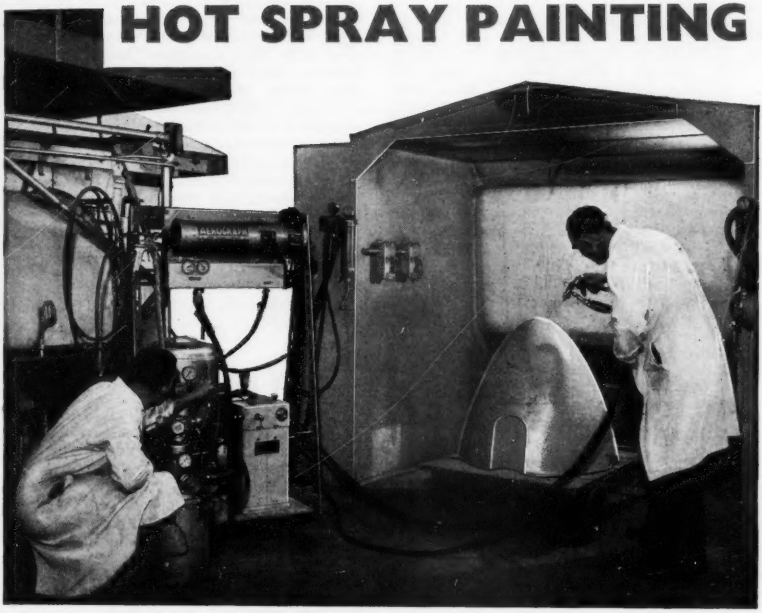
tinct increase while in others, somewhat surprisingly, chlorination appeared to reduce corrosion.

Wormwell, with Mercer (19), has also shown that a 0·05 per cent aqueous solution of sodium benzoate completely inhibits the corrosion of copper among other metals in tap water and dilute chloride solutions at room temperature. The tests were not extended to brass or other copper alloys. A novel suggestion for the protection of polished copper and silver surfaces has been proposed by Loiseleur (20), namely, the formation of a monomolecular film of purple of Cassius (a precipitated mixture of tin hydroxide and metallic gold). It is said that only exceedingly minute quantities of the reagents are required to impart almost complete resistance to oxidation and tarnishing by sulphur compounds. Both Bollinger (21) and Welsh (22) have studied the effects of sulphur compounds on copper and brasses among other alloys, the former being concerned with the amount of water and oxygen which can be tolerated in sulphur dioxide without leading to serious attack on the metal, while the latter concentrated upon the corrosion of gas appliances by hot sulphuric acid condensate.

More directly concerned with copper is the work of Dennison and Preece (23) on the oxidation of its alloys with beryllium, aluminium, magnesium, silicon and chromium. The effectiveness of these additions in conferring resistance to oxidation at elevated temperatures was found to decrease in the order mentioned, chromium conferring no protection at all. The strongly protective nature of the film of alumina which forms on the surface of heated aluminium bronze is well recognised and for this reason aluminium bronze has been proposed for the tubing of gas turbine heat exchangers. Unfortunately the promising results obtained in laboratories have not been substantiated under practical service conditions, for it is understood that an experimental heat exchanger tubed with aluminium bronze has given disappointing results.


1. Saltonstall, R. B. A Critical Look at White Brass Plated Coatings. *Materials and Methods*, 1953, vol. 37, Feb., p. 97.
2. Binai, W. R. Increasing Copper Content in White Brass and Copper Cyanide Solutions by Electrolytic Regeneration. *Plating*, 1952, vol., 39, Oct., p. 1120.
3. Lowenheim, F. A. Electrotinning Copper Wire. *Metal Ind.*, 1952, vol. 81, Oct. 31, p. 348.
4. Anon. Electrodeposited Mesh. *Metal Ind.*, 1952, vol. 80, Aug. 1, p. 88.
5. Heritage, R. J. and Balmer, J. R. Metallising of Glass, Ceramic and Plastic Surfaces. *Metallurgia*, 1953, vol. 47, Apr., p. 171.
6. Narcus, H. Metallisation of Non-Conductors. *Brit. Pat.* 674,630.
7. Colegate, G. T. Mechanical Surface Finishing of Metals *Sheet Metal Ind.*, 1952, vol. 29, pp. 71, 163, 257, 645.
8. Mable, L. Polishing and Barrel Finishing. *Metal Ind.*, 1953, vol. 82, Mar. 13, p. 206.
9. Sawyer, J. W. Review of Surface Finish Literature 1945-1951. *Machine Design*, 1952, vol. 24, Sept., p. 147, Oct., p. 328, and Nov., p. 286.
10. Kaurat, J. Electropolishing of Brass. *Metallurgie*, 1952, vol. 84, No. 5, p. 363. (In French.) *Metal Finishing*, 1952, vol. 50, Dec., p. 72.
11. de Jager, W. G. R. Stress-Corrosion in Brass. *Metallen*, 1950, vol. 4, No. 7, p. 138; No. 9, p. 185.
12. Bailey, A. R. High Tensile *Beta* Brass. *Metal Ind.*, 1952, vol. 80, June 27, p. 519 and p. 526.
13. British Non-Ferrous Metals R. A., Eborall, R. J. L. and Perryman, E. C. W. *Beta*-Brasses. *Brit. Pat.* 683,122.
14. Hannon, C. H. A Practical Evaluation of Metallic Coatings as Affecting Sensitivity to Stress-Corrosion Failure. *Metal Finishing*, 1952, vol. 50, Oct., pp. 65 and 71.
15. International Nickel Co. Report on Specimens Removed from Sea Water Tests at Kure Beach, N.C., May, 1949. *Corrosion*, 1952, vol. 8, Sept., p. 32.
16. Gilbert, P. T. and Porter, F. C. Tests on the Corrosion of Buried Aluminium, Copper and Lead. Symposium on Corrosion of Buried Metals, Iron and Steel Inst., 1951, p. 55.
17. Ingleson, H., Sage, A. M. and Wilkinson, R. Effect of Chlorination of Drinking Water on Brass Fittings. *J. Inst. Water Eng.*, 1949, vol. 3, Jan., p. 81.
18. Wormwell, F. and Nurse, T. J. Corrosion of Mild Steel and Brass in Chlorinated Water. *J. Appl. Chem.*, 1952, Dec., p. 685.
19. Wormwell, F. and Mercer, A. D. Sodium Benzoate and other Metal Benzoates as Corrosion-Inhibitors in Water and in Aqueous Solutions. *J. Appl. Chem.*, 1952, vol. 2, Mar., p. 150.
20. Loiseleur, J. Immunization of Metallic Surfaces (of silver and copper) against the Action of Corrosive Agents, *Compt. rend.*, Acad. Sci. Paris, 1952, vol. 234, No. 2, p. 260.
21. Bollinger, J. Corrosion-Resistance of Various Metals in Liquid Sulphur Dioxide. *Schewiz. Archiv.*, 1952, vol. 18, Oct., p. 321.
22. Welsh, J. Corrosion of (town) Gas-burning Appliances. *Chem. Ind.*, 1952, June 21, p. 551.
23. Dennison, J. P. and Preece, A. High-Temperature Oxidation Characteristics of a Group of Oxidation-Resistant Copper-Base Alloys. *J. Inst. Metals*, 1953, vol. 81, Jan., p. 229.

# HOT SPRAY PAINTING



## *How to Control the Finish—from the Start*

The great advantages of Hot Spray painting are only just being realised. For many industrial purposes the use of the pre-heating process will give an excellent finish much more quickly, with less labour and with an appreciable saving in cost.

For those who want to know more about it, the Demonstration Centre offers full facilities for practical demonstrations on customers' own products. What is more, we will gladly train paint-shop operatives at specially arranged short intensive courses—at no cost or obligation to the customer.

This is *your* opportunity to gain impartial and unbiased advice on the process that is revolutionising many industrial finishing procedures. If the process is suitable for *your* product, we will show you how best to use it. If it is *not* suitable we will save you expensive "trial and error".

The photograph shows a corner of the Demonstration Centre with operators hot-spraying synthetic enamels at the water-washed spray-booth. Three types of paint heaters are shown in the illustration. Take advantage of this "know-how" and let us help you to *control* your finish.

Just write to—

**Demonstration Centre**

**JOHN HALL**

JOHN HALL AND SONS (BRISTOL AND LONDON) LTD · HENGROVE · BRISTOL 4

## PLANT AND MACHINERY CATALOGUE

PRIOR to the war, it may be recalled, George Cohen and Co. Ltd. used to issue regular editions of their catalogue of new and second-hand machinery and plant which they had in stock. This catalogue was a very handy guide to the availability of equipment and was usually to be found in most engineers' offices. The restrictions on the use of paper during the war, naturally put an end to the publication.

This week we were both surprised and pleased to see that it has been revived and a copy of the first issue appeared on our desk a few days ago. An accompanying note informs us that it will be published several times a year in future.

## A.D.A PUBLICATIONS AND FILMS

THE Aluminium Development Association has just published its "List of Publications and Films," which deals with the printed publications of the Association that are generally available and lists the sound films and film strips that are available on loan. Copies of the booklet, which is revised from time to time as new publications and films are issued, may be obtained from the Aluminium Development Association, 33 Grosvenor Street, London, W.1.

## COUNTER RUNNING BELT SANDING MACHINE

FROM Germany comes news of a new style sander for wood finishing operations. It is a belt sanding machine which has two belts running side-by-side, not in the same direction but in opposite directions. It is thus possible to work with both belts simultaneously and then the sideways forces on the sanding assembly are balanced so that there are no sideways forces on the handle. The operative uses the handle more as if it were an instrument key. With this new machine the strength needed for sanding is so small that tiring of the operative, which has always arisen previously, is quite obviated. He needs merely to exert pressure downwards and therefore has a very sensitive "feel" for the degree of pressure required at all times.

With the older types of sanding machines with single belts, minute wood fibres lie in the sanding direction as if brushed, particularly if the belt is worn. When sanding with two belts in opposite directions at once however, the workpiece is subjected to a continually changing action and the small fibres are taken off smoothly. This action, in combination with the sensitive "feel" on the handle, gives a mirror-like smoothness, particularly when the belts have been well used. The twin sanding shoe is so constructed that normally both belts are in action simultaneously. Either belt can be used alone, however. This is done simply by turning the handle to left or right. Two belts with the same grain-size can be used, or two belts with different grain-sizes, or either belt alone, so that particular areas can be treated with coarse and/or fine grain in one operation. The German supplier is: Hans Johannsen, Maschinenfabrik, Battenburg, (Eder) Germany.

## A NEW BRITISH STANDARD

A NEW British Standard—B.S. 19986: 1953—contains recommendations for the Dimensional Features of Measuring and Control Instruments and Panels for Industrial Processes.

The use of automatic control and measuring instruments in the processes of the oil, steel, chemical and other industries is increasing rapidly. This equipment indicates, records and controls physical variables such as pressure, temperature, level and rate of flow, of many different fluids.

The increasing complexity of modern plant calls for a greater degree of flexibility of such equipment than exists at present, and this in turn requires interchangeability of the instruments employed.

The British Standards Institution has recently issued recommendations for certain of the dimensional features of such industrial measuring and control instruments and of the panels in which they are mounted.

These recommendations are intended to encourage the adoption of this principle of interchangeability and to ensure satisfactory operation in cases where items of equipment complying with the recommendations are connected together, even when they have been made by different manufacturers.

Although it is appreciated that it will take time for standard dimensions to be widely adopted, it is hoped that the publication of these recommendations will hasten the achievement of interchangeability, and that agreement to standardise the dimensions and other details of automatic control and measuring instruments will be the eventual outcome.

The present recommendations specify the dimensions of circular and strip-type charts for recorders, and give the over-

all dimensions and mounting dimensions for clocks for circular chart and drum type recorders, together with the appropriate drum sizes for the latter; they indicate the appropriate sizes of screw threads for the measurement connections and pneumatic connections to instruments and give guidance on the air pressure range for automatic control and remote indication or recording instruments.

Recommendations are given regarding the sizes and constructional features of panels and sub-panels and for the aperture sizes for instruments with circular and rectangular cases, and guidance is given as to the manner of fixing instruments to panels.

Copies of this standard may be obtained from the British Standards Institution, 2 Park Street, London, W.1, price 3s.

## TESTS ON METAL COLOURING PROCESS

THE photographs reproduced below were recently received from Metal Processes Ltd., of Erdington, Birmingham, and show some interesting results of a series of tests recently carried out on their Mark II blackening process.

Two steel plates were treated at the same time, one with Mark II Black and the other with phosphoric acid. Subsequently the lower halves were both painted with grey enamel. Then both plates were exposed for four weeks at a temperature of 35° C., and a relative humidity of 100 per cent.

---

**The Director's report** and accounts of the Electric Furnace Co. Ltd., received as we go to press, contain a report from the chairman of the company on the progress of the various subsidiaries of the group. A new company, to be called Efco-Lindberg Ltd., is being formed to exploit the Canadian market for melting and heat treatment furnaces, Electro-Chemical Engineering Ltd., had another successful year and the Electric Resistance Furnace Co. Ltd., are proceeding with important new developments in connection with gas carburising and carbo-nitriding.

*Comparison of steel plates, after ageing test of four weeks.*

*Temperature:* 35° *C. Relative humidity:* 100 *per cent.*

*Fig.* 1. *Treated with phosphoric acid and lower half painted with grey enamel.*

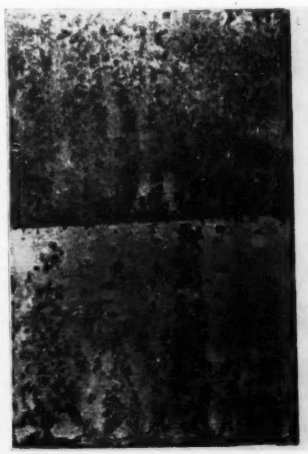
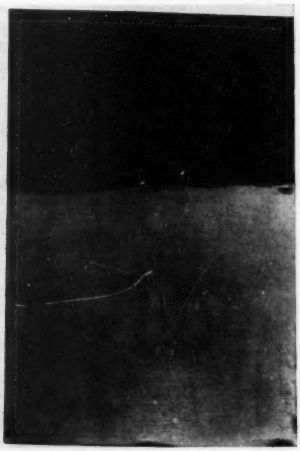


*Fig.* 2. *Treated with Mark II black process and lower half painted with grey enamel.*



# Industrial Finishing Reports on the Engineering and Marine Exhibition

AS this journal goes to press, the above exhibition is in progress and will remain open until September 17th. All the halls of the Olympia exhibition buildings are occupied and the Engineering Exhibition proper occupies the Grand and National Halls, Ground and First Floors and the Empire Hall First Floor; the Welding Exhibition occupies the Ground Floor of the Empire Hall and the Chemical Plant Exhibition occupies the Ground Floor of the Grand Hall opposite the Addison Road entrance.

Whilst it is not possible, or even desirable, to give a detailed description of the individual exhibits on every stand, as many of them dealt exclusively with heavy engineering and marine work, we have prepared a list of the exhibits which had a particular interest for the finishing trade in general.

**Atlas Preservative Company, Limited, Fraser Road, Erith, Kent.**

This firm were showing their "Atlas" vapour degreasing process for removing oil and grease from such equipment as condenser tubes and heat exchangers *in situ*, and the "Atlas Condenflu" process for removing scale from the water side of condensers, calorifiers, etc.

The "Atlas" range of wood preservatives for cleaning and conditioning wood decks, alley-ways, etc., was also shown. "Atlas" marine paints and a special aluminium finish capable of withstanding temperatures up to 600°C suitable for use on exhaust stacks, fire-doors, etc. formed the remainder of the exhibit.

**The British Ceca Company, Limited, 175 Piccadilly, London, W.1.**

The display on this stand showed problems of adsorption in the vapour phase and general treatment of effluent gases.

Layout and cycle of operations of a typical Acticarbone solvent recovery plant were shown and in addition there were scale models of solvent recovery and electrostatic precipitation plants. Information was available relating to equipment for $CO_2$ treatment, air and gas drying, gas purification and associated problems.

They also displayed various grades of activated carbons manufactured by the company for adsorption, purification, decolorising and deodorisation, together with samples of activated earths, bentonites, filter aids, kieselguhrs, pine tars and refractory insulating bricks.

**Bullows, Alfred & Sons Ltd., Long Street, Walsall, Staffs. Telegraphic Address: Bullows, Walsall. London Office: 13 South Molton Street, W.1.**

The main exhibit was the new range of Bullows Hydrovane rotary air compressors, whose introduction aroused world-wide interest. These compressors have no valves, pistons, connecting rods or crankshafts, the only moving parts being a slotted meehanite rotor and alloy cast-iron vanes, which are

*Bullows hydrovane rotary compressor unit*

# ROCKHARD
## HAMMER FINISH

505

The new Rockhard 505 two-tone Hammer Finish has been evolved to meet the demand for a material which is **fool-proof in application**—even vertical surfaces can be sprayed without any special care. 505 gives a constant pattern under all conditions.

**OUTSTANDING FEATURES OF ROCKHARD 505**

One full coat is sufficient

Economical in use

Excellent finish

Easily applied

Reasonable in cost

Needs normal spray gun equipment only

**Write in now for further information on Rockhard 505 or telephone and ask for a technical representative to visit you**

GITTINGS & HILLS
LIMITED
ENGINEERS OF INDUSTRIAL FINISHES
TOWER VARNISH WORKS, LONG ACRE, BIRMINGHAM
Telephone: East 0297/0298

submerged in oil.

In addition to the Hydrovane compressors up to 65 c.f.m. which were running, the small PR.303E spray painting plant was shown. These units weigh only 42 lb. and have outstanding spraying performance.

A full size working waterwash spray booth was exhibited and an automatic traversing spray gun sprayed paint continuously into this booth.

**Cathodic Corrosion Control Limited, 73 South Audley Street, London, W.1.**

A corrosion prevention service to industry as a whole. Specialists in soil and cathodic protection surveys; engineering, supply of equipment, installation of cathodic protection schemes for pipelines, jetties, storage tanks, ships and ferrous structures in contact with soil and/or water.

**Controlled Heat and Air Limited, Cornwall Road, Smethwick, Birmingham 40.**

Static and continuous ovens for all processes including tinprinting, paint and enamelling, pre-treatment plant, vitreous enamelling, core and mould drying, wire drying, core-plate varnishing, Sherardizing plant, light alloy heat-treatment, dust extraction and collection.

**Dexine Rubber & Ebonite Ltd., Rochdale, Lancs.**

Dexonite hard rubber centrifugal pump, rotary gear pump, reciprocating pump, carboy pump and diaphragm pump.

Dexonite-Saunders diaphragm valve. Pipes lined in soft and hard rubber. Tanks lined with soft and hard natural rubber, polyiso-butylene, butadiene-acrylonitrile, styrene-butadiene, co-polymer and polyvinyl chloride. Dexonite hard rubber valves, bends, tees, piping and fittings. Plastic valves, bends, tees, piping, fittings and centrifugal pump.

**Doulton & Company Limited, Doulton House, Albert Embankment, London, S.E.1.**

Stoneware and porcelain plant for the chemical industry.

Porous ceramics embracing various types of filters, diffusers, diaphragms and ancillary equipment for use in industry and research.

**Elcontrol Ltd., 10 Wyndham Place, London, W.1.**

The on-off electronic controllers exhibited included examples of the following types of standard equipment:

Process timers and interval switches for timing ranges up to 300 secs. and of high repetitive accuracy, and suitable either for single or automatic continuous switching. Furnace safeguard equipment; photoelectric and infra-red sensitive units were shown, giving immediate fuel cut off on flame failure with gas, oil or PF fired furnaces.

Photoelectric temperature controller gives automatic control of resistance welding and heat-treatment processes at desired pre-set temperatures. Liquid level control. Automatic pump control in relation to tank level was demonstrated.

**Electric Construction Company Ltd., The, Bushbury Engineering Works, Wolverhampton.**

"E.C.C. in Six Reigns," included a direct current motor complete with switch panel made in the 1880's, and also a diesel-driven 5 kVA "Continuity" alternator set with special "no-break" feature designed for telecommunications and other essential services. This equipment, complete with demonstration control gear, was connected to a teleprinter loaned by the G.P.O. to demonstrate how the set maintains supplies when the mains are broken. The teleprinter was arranged with an automatic recorder and connected to the alternator set so that those interested could demonstrate for themselves the effective way in which the set provided "no-break" features.

**Enamelled Metal Products Corp. (1933) Ltd., Artillery House, Artillery Row, London, S.W.1.**

This company produces in Scotland the Pfaudler glass-lined chemical equipment. They displayed a complete glass-lined distillation unit, comprising jacketed reaction kettle, condensers, receivers and connecting pipe, all constructed in glass-lined steel. In addition various small items of glass-lined plant, such as valves and piping were shown.

**Evershed & Vignoles Ltd., Acton Lane Works, Chiswick, London, W.4.**

Remote indication and control equipment; electronic repeaters for remotely indicating levels, pressure, flow,

electrical quantities and mechanical positions of industrial mechanisms; also the Evershed precise level tank gauge and "Noflote" control.

Electrical tachometers for industrial and marine use; the "Dionic" water purity meter operating from the Evershed-Straub degassing condenser.

Testing sets; latest "Megger" insulation testers and earth testers, including the new six range, three-voltage (5,000 v./2,500 v./1,000 v.) mains operated tester.

**Flexible Drives (Gilmans) Limited, Carlton House, 195 High Street, Smethwick, 41, Staffs.**

All types of flexible shaft power drives for tube and surface scaling, rust removing, ship scaling, sanding, drilling, polishing, grinding. Makers of rotary milling cutters and rotary hand-cut files. The latest design this year was the "Flexmaster" machine, together with "Flexmaster" tungsten carbide rotary cutters which were exhibited.

**The Flextol Engineering Co. Ltd., Green, Ealing, London, W.5.**

A complete range of flexible shaft power tools were exhibited, motorised both petrol and electric. Recent developments included a new technique for cutting runners and risers of ferrous and non-ferrous castings employing a Nylon bonded abrasive cut-off wheel; high-speed grinding with resinoid hub discs, 7 in. and 9 in. in diameter, with high-speed power tool; a high-speed equipment for tungsten carbide burrs; an adjustable angle attachment for chamfering the edges of plastic panels; an adjustable angle attachment for bevelling plate glass; a weld trepanning equipment for inspection of welded joints on steel tubes, suitable for tubes 3 in. diameter—36 in. × $\frac{1}{8}$ in. thick, together with the Company's range of grinders, sanders, screwdrivers, rotary filing and hand milling machines, special equipment for wood finishing, including filler rubbing and cellulose finishing equipment, etc.

**The Gas Council, 1 Grosvenor Place London, S.W.1.**

The latest gas-fired steel hardening equipment was featured on the Gas Council's stand, demonstrations being given at frequent intervals during the day, showing how the equipment, operated automatically by gas, produces results of outstanding efficiency, and with unrivalled ease and speed. Models of coke-fired furnaces of new design were also on display. A wide variety of literature on gas and coke appliances in industrial processes were available to visitors, together with expert advice from skilled technicians.

**The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2.**

This British electrical manufacturing organisation produces marine electrical equipment of every description, including propulsion and auxiliary machinery, ventilating and lighting equipment, communications and sound apparatus, fire alarm systems, galley equipment, lifts, self-discharging conveyor equipment and ship wiring cables.

The G.E.C. stand displayed examples of this range of marine electrical engineering products and services including a section of a switchboard and a double-oven range, together with illustrations of some of the many notable marine installations carried out by the company.

**Girdlestone Pumps Ltd., 23 Davies Street, London, W.1.**

NR and NRF range of centrifugal pumps in sizes $\frac{1}{4}$ in.-6 in. All sizes designed for industrial duties. Certain sizes available in special metals. Exhibited engine and electric motor driven, as fast and loose pulley sets and close coupled motor pumps.

Hot water circulators. These are the company's centrifugal pumps fitted with special impellers and driven at low speeds from fractional horsepower motors situated above the pumps.

Vertical spindle pumps. Centrifugal pumps arranged for sump drainage duties. Available in one size only but with varying shaft lengths.

Glandless diaphragm pumps. Single and twin body units for handling corrosive and abrasive liquids. Can be supplied with cast iron, gunmetal or ebonite lined bodies.

Rotary pumps. Small vane type pumps for non-abrasive viscous fluids.

Float switches. Two types available, one with mercury tube and the other silver contact single pole type.

**Honeywell-Brown Limited, 1 Wadsworth Road, Perivale, Greenford, Middlesex.**

Brown indicating, recording and controlling "continuous balance" Electronik potentiometers. The response of the instruments demonstrated varies from two to thirty seconds for full-scale travel. Electr-o-pulse (time proportioning) and Air-O-Line (three-term pneumatic control) forms were shown. For thermocouples, resistance bulbs, radiation tubes, or other millivolt applications.

Brown "differential converter", diaphragm type, pneumatic flow transmitters with associated miniature and conventional recording/controlling receivers, for all primary and process flows. Brown "Protectoglo" combustion safeguard systems, single and multi-burner protection.

Honeywell electronic modulating, non-indicating, controls for space heating, air conditioning, and low temperature industrial applications operating on continuous balance resistance bridge principle.

**Imperial Chemical Industries Ltd., Dyestuffs Division, Hexagon House, Blackley, Manchester, 9.**

Lissapol N for desludging oil fuel tanks. Lissapol NDB—a general purpose detergent. Vantocs—bactericides for washing crockery and glassware. Lanoc CN—for mothproofing of woollen carpets and upholstery fabrics.

**Imperial Chemical Industries Ltd., Metals Division, Kynoch Works, Witton, Birmingham, 6.**

I.C.I. Metals Division were exhibiting condenser, cooler and other special tubes for land and marine power stations, sugar and oil refinery plant. Alloys include "Kunifer" 30 and 30A, "Alumbro," "Resisco," Admiralty and 70/30 brass.

"Kunifer" 5 (copper-nickel-iron) sheet and tube for sea water trunking. A 16 in. diameter flanged tube welded from "Kunifer" 5 sheet and flanged both ends.

"Kynal" aluminium alloy extrusions for structural work, tread and chequer plate for engine room floors, catwalks, etc.

Copper tubing to B.S. 659 and "Kuterlon" copper tubing to B.S. 1386. Fyffe's "Intex P.T.," "Instantor," "Coneor" and "D.D." fittings, including flanged "D.D." fittings for pipelines up to 8 in. diameter.

Plate, sheet, strip, tube, extrusions, wire in copper and copper alloys, aluminium and aluminium alloys. "Kutern" high speed turning copper, "Kumium" for welding tips.

**Imperial Chemical Industries Ltd., Plastics Division, Black Fan Road, Welwyn Garden City, Herts.**

I.C.I. Plastics Division showed thermosetting and thermoplastics of special interest to the engineering and chemical trades. Particular emphasis was given to foundry resins, polytetrafluoroethylene, nylon mouldings and rigid P.V.C. Examples were shown of some of the most ambitious shell mouldings, produced with the aid of "Mouldrite" resins and also various cores.

**The Incandescent Heat Co. Ltd., Cornwall Road, Smethwick, Birmingham, 40.**

Metallurgical furnaces and equipment for all processes utilising all types liquid, gaseous and solid fuels. Vertical tower type furnaces for the annealing of ferrous and non-ferrous strip. Continuous gas carburising, bright annealing, brazing, normalising, malleableising, enamelling plant. Pottery kilns and gas producing plant including automatic gas machines, charging machines, complete new range of foundry equipment, Incanite new process cast-iron. Heat treatment plant including bogie hearth furnaces and pressure vessels both for the marine and the chemical industry.

**Jenson & Nicholson Limited, Jenson House, Carpenters Road, Stratford, London, E.15.**

This exhibit showed the versatility and scope of the range of marine and engineering finishes manufactured by this company and used so extensively in Great Britain and overseas. Panels and true-to-scale models showed practical applications of various specialities, including:

"Seaborne" marine paints, varnishes, enamels, anti-corrosives and anti-foulings, engineering finishes of all descriptions, including machinery enamels, stoving enamels, wash primers, etc.

"Liquid Envelope." Peelable protective plastic coatings. "Debecote" for

condenser tubes, propellers, impellers, etc. "Solventless" electrical insulating varnishes. "Cuprinol" preservatives for timber, canvas and cordage.

**Johnson, Matthey & Co., Limited, 73-83 Hatton Garden, London, E.C.1.**

Mallory materials, electrodes, holders and accessories for resistance welding. Low temperature silver brazing alloys. Platinum and platinum-lined, silver and silver-lined chemical process plant. Noble metal catalysts. Platinum laboratory apparatus. Other specialised materials and components for engineering.

**Merrill Pumps Ltd., Cavendish Road, Sheffield, 11.**

Glandless self-priming tube diaphragm pumps for hydrochloric acid, hydrofluoric acid, sulphuric acid, acetic acid, pickling acids, plating liquors, sodium hypochlorite, ammonia liquor, chemicals and slurries, etc.

**Metal Porcelains Limited, Cornwall Road, Smethwick, Birmingham, 40.**

Complete vitreous enamelling plants, suppliers of complete range of frits and oxides, grinding mills, fusing furnaces, both static and continuous, pickling, washing and degreasing plant, drying ovens, spraying and dipping units, spray guns, etc.

**Metallizing Equipment Co., Ltd., Chobham, Woking, Surrey.**

Manufacturers of "Metco" metal-spraying equipment, showed the latest and most efficient Metallizing guns, accessories and supplies. The metal-spraying guns range from a small unit, using only 10 c. ft. air per minute, to heavy-duty high speed production tools.

Exhibits included worn and mis-machined parts salvaged by the Metallizing process, samples of hard-faced coatings and the "Metco" anti-corrosive coating systems for most industrial applications.

**The Mond Nickel Company Limited, Thames House, Millbank, London, S.W.1.**

This stand offered technical information on nickel and its alloys. Castings in the new spheroidal graphite iron formed the main feature of the exhibit. Publications on a wide range of subjects were available on request.

**Nordac Limited, Chemical Engineers, Cowley Mill Road, Uxbridge, Middlesex.**

Mild steel, rubber and tile lined tank, heated and agitated by submerged combustion, fitted with a fume extraction unit, constructed to be entirely suitable for acid pickling process.

A rubber-lined reciprocating pump designed for pumping corrosive solutions.

A submerged combustion burner operating in a glass vessel which clearly shows the combustion below the water level.

Three mild steel tanks lined with the following materials:

(a) Homogeneous lead lining.
(b) Vulcoferran lining.
(c) Butyl rubber lining.

Rubber-lined valves ranging from 1½ in. to 4 in. as used for corrosive acids.

An oil combustion chamber as used for submerged combustion acid evaporation plant.

A gas combustion chamber as used for submerged combustion acid evaporation plant.

Miscellaneous items — rubber-lined pipes and fittings, lead coils and other small exhibits.

**Prodorite Limited, Eagle Works, Wednesbury, Staffs.**

Anti-corrosive materials and constructions including tanks for the pickling, chemical and plating industries. Acid and alkali resistant flooring and channels. Neutralising systems. Fume extraction plant in fabricated P.V.C. and other plastics. Acid resisting cements and compounds and anti-corrosive protective coatings and linings. Special heavy duty industrial floor surfaces.

**Rozalex Limited, 10 Norfolk Street, Manchester, 2.**

The exhibit showed how barrier creams, applied to the hands before commencing work, form an invisible glove protecting the skin against irritant materials and factory grime, and have proved the most effective means of combating occupational dermatitis, thereby minimising the wastage of manpower caused by this dreaded disease.

For instances where Rozalex barrier creams have not been in use, there are:

Rozalex Lanolin after-work creams

for cracking, irritation and chafing of the skin.

The Rex dispenser, an appliance specially designed for issuing Rozalex barrier creams economically to users in factories and workshops.

**Shipston Engineering Co., Ltd., Norgren Works, Shipston-on-Stour, Warwickshire.**

Norgren airline equipment and Sundstrand, Wunpad and Johnson pneumatic sanders are manufactured at Shipston, and a comprehensive display of these units and machines was made. The Norgren range includes air filters, pressure regulators and airline lubricators. Examples of the greatly increased range were displayed and demonstrated.

The sanders are all handy-sized, easy to operate, straight line action machines for undertaking the "rubbing-down" and finishing operations on all types of products. A fully equipped demonstration bench allowed the various machines to be tried out at all times during the Exhibition.

**Teddington Industrial Equipment Limited, Windmill Road, Sunbury-on-Thames.**

This exhibit covered a wide range of automatic control equipment for heating, ventilating, air conditioning and industrial process applications. Included, was the new range of "Teddington" engine protection panels and shutdown equipment for diesel engines. Other products shown included industrial thermostats and pressure controls, humidity controls, thermostatic valves, electric proportioning valves and controllers, motorised valves and damper units, magnetic valves, strain gauges, electrical switchgear.

**The Walterisation Co., Limited, Waddon Marsh Way, Purley Way, Croydon, Surrey.**

Rust-proofing and metal finishing processes for steel, cast-iron, zinc and aluminium. Industrial products showing the value of Walterisation for bonding of paint and prevention of rust; Foscote R.S. for destroying rust; Deran for dissolving rust; Walterisation "L" process for chemical oxidation of aluminium and its alloys; Walterblak for decorative treatment of steel. Details of two new rapid phosphating processes, announced since the 1951 exhibition, were available. A demonstration of the cold brush-on rust-destroying phosphate process (Foscote R.S.) was given. A large pictorial map showing the spread of these processes over the world formed part of the exhibit.

## SPRAYGUN PAINT STRAINER

DEVELOPED by the Gardner Laboratories in America is a miniature paint strainer which fits on the end of the suction tube of standard paint sprayguns. Called the "Rein Midget" this paint strainer ensures that all guns fitted with it work smoothly and without spitting or blockage.

A 60 mesh copper screen traps and holds dirt, paint lumps and other contaminants, preventing them from stopping the gun or marring the smooth finish of the job. A plastic washer acts as a friction lock, and prevents "overflowing" or entry of the paint into the top of the strainer. A flange protects the suction tube and the copper screen, assuring a "full flow" of highly strained paint, giving full use of strainer without damage to strainer, gun or the job in hand.

**The Polyester Handbook**

Whilst, in the U.S.A., much literature has been produced on the development of reinforced glass fibre plastics, we have seen very little over here of value to the actual fabricator.

This little book, published by Scott Bader and Co. Ltd., of 109 Kingsway, London, W.C.2, aims at filling this gap. It contains full working instructions for the laminating, preform moulding, casting and other working of the resins. A section dealing with the basic chemistry of polyesters and the methods of using their characteristics to the best advantage is included.

Photographs in the book show applications of Marco and Crystic resins in the boat-building, aircraft and general industrial fields.

**A new type of drum sled** has recently been introduced by Developed Products Ltd., of Petty Curry, Cambridge. With this unit it is claimed that a man can handle drums and barrels of 25 to 50 gal. with ease and safety. Loading is done by tilting the drum and placing the sled under the end. The sled then forms a cradle for the drum during use and the wheeled portion is removed for use elsewhere. The Japa drum sled weighs 22 lb. and costs £7 10s. net.

# "Styled in the modern idiom"—

**—when applied to the latest products of British Industries, implies new conceptions, new materials and often new technology.**

*Our latest development in Metal Finishing Technology is the BONDERIZING 'SS' Process which is assisting the cold forming of Stainless Steels, and similar materials.*

In twenty-five years we have accumulated a great deal of experience, and its associated "Know-How", in the industrial application of Phosphate and allied Coatings. Our Metal Finishing Processes in the BONDERIZING, PARKERIZING, PARCO-LUBRIZING and PYLUMIN ranges now number twenty-two, and are in daily operation in over 1500 plants throughout the British Isles.

*One of them is almost certain to be the answer to that problem that's bothering you. Why not consult us?*

**BONDERIZING** — Bonds Paint to Metal Surfaces.

**BONDERIZING** — Assists the Cold Working of Steel.

**PARKERIZING** — Rustproofing Process.

**PARCO-LUBRIZING** — Reduces Wear on Bearing Surfaces.

**PYLUMINIZING** — Bonds Paint to Aluminium.

**THE PYRENE COMPANY LIMITED — METAL FINISHING DIVISION**

*Great West Rd., Brentford, Middlesex.* Telephone EALING 3444

## TECHNICAL INFORMATION ON GERMAN INDUSTRY

READERS may like to be reminded that the technical Information and Documents Unit of the Department of Scientific and Industrial Research has published the following reports of interest, which may be borrowed from the Unit without charge or obligation:

FIAT 681. The Paint, Varnish and Lacquer Industry of Germany.

BIOS 712. German Artists' Colour Manufacturers.

FIAT 814. German Production of some of the more Important Inorganic Pigments.

BIOS 1272. Inorganic Pigments, Synthetic iron oxides.

BIOS 451. Titanium Pigments.

BIOS 1455. Luminescent Pigments.

FIAT 1144. Utilisation of Tall oil in Germany.

BIOS 1521. Manufacture of White Lead.

BIOS 1661. German Organic Pigments and Lake dyestuffs.

BIOS Overall No. 22. The Paint Industry in Germany during the period 1939-1945.

Enquiries on the reports, their subject matter or the original documents on which the reports are based should be addressed to:

Department of Scientific and Industrial Research, Technical Information and Documents Unit, Cunard Buildings, 15 Regent Street, London, S.W.1.

## NORTHAMPTON POLYTECHNIC

THE prospectus is now available of part-time courses in pure and applied chemistry, and leaflets are available to cover the University Degree in Engineering, B.Sc.(Eng.), Mechanical, Civil and Aeronautical Engineering, Electrical Engineering, including Telecommunications, Applied Physics and Mathematics, Pure and Applied Chemistry, Instrument Engineering, Production Engineering, Ophthalmic and Dispensing Optics, and Watch and Clock Repairing.

Particular attention is drawn to the courses leading to the Associateship of the Royal Institute of Chemistry and the Licentiateship and Associateship of the Institution of Metallurgists, as well as courses in fuel technology, metal finishing and chemical engineering.

Of particular interest also will be a course of twelve evening lectures on refractories by L. R. Barrett, M.A., B.Sc., M.S., A.R.I.C., M.Inst.F., on Tuesday evenings at 7 p.m., commencing on 29th September, 1953.

In addition there is a course of eight evening lectures on "Chemical and Metallurgical Thermodynamics" by Dr. O. Kubaschewski, on Wednesday evenings at 7.30 p.m. commencing on 30th September, 1953.

Full details of all courses are available from the Secretary, Northampton Polytechnic, St. John Street, London, E.C.1.

## THE NICKEL BULLETIN

*THE NICKEL BULLETIN*, July, contains abstracts of an important series of papers presented at the Washington Conference on Magnetism held last year. Information on the magnetic characteristics of nickel and of nickel alloys of both high-permeability and permanent-magnet types is given in a number of these papers. Various papers from other sources on magnetic alloys are also reviewed.

The section on heat-resisting materials includes an abstract of the results of a study at the National Physical Laboratory of the influence of cyclic stress and temperature on the creep behaviour of alloys of the Nimonic series, and of a report on hardening phenomena occurring in austenitic chromium-nickel steels at 475° C. Abstracts on corrosion-resisting steels refer to research on the amount of oxygen found on the surface of passive stainless steels and the thickness of oxide film to produce passivity, and to comparative tests of the resistance of titanium, zirconium and stainless steels to organic compounds.

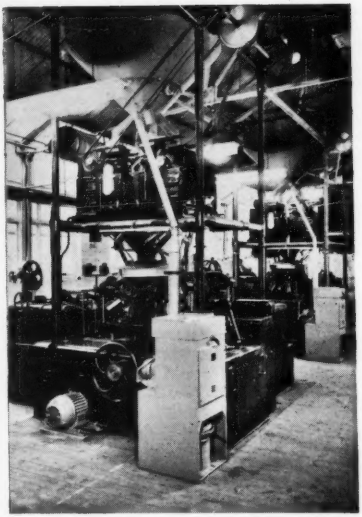
Recent papers on spheroidal-graphite cast iron are summarised and attention is drawn to a revised British Standard specification for condenser-tube alloys covering copper, brass, bronze and copper-nickel alloys.

The issue marks the completion of twenty-five years continuous publication of *The Nickel Bulletin* and includes a short review of the aims and scope of this publication.

## DUST IN INDUSTRY

The control and elimination of dust is a vital necessity in many industrial operations. Typical examples of interest to readers of this journal are the paintshop, the laboratory, the paint mixing room and the plating shop; where this latter is adjacent to a dust-producing process, large amounts of dust mean contamination of the solutions.

In this connection a range of dust-collecting plant recently shown at the



*Dust-collecting equipment applied to tea-packing machinery*

Engineering and Marine Exhibition by Dallow, Lambert and Co. Ltd. will be of interest. There are equipments available for most of the special problems met with and typical examples were exhibited. The accompanying photograph shows a special installation in a tea-packing factory, the equipment is adaptable for many other applications.

## NEW "FLUON" PLANT IN OPERATION

A NEW I.C.I. plant to manufacture "Fluon" brand of polytetrafluoroethylene has now come into operation, and "Fluon" is freely available after three years of restricted supply. This was caused by an explosion which occurred in the original P.T.F.E. factory in 1950 and completely stopped production.

I.C.I. started producing P.T.F.E. on a limited commercial scale in 1948, and from the middle of 1949 almost the entire output was ear-marked for vital Government needs, the small plant being unable to satisfy developing industrial demands. Immediately after the explosion, I.C.I. started work on the new and larger plant which is now operating.

Polytetrafluoroethylene, the only completely fluorinated high polymer, is remarkable for its wide range of working temperature, which extends from −100° C. to +250° C. or, in special circumstances, to 300° C. In addition, it possesses extreme chemical inertness and solvent resistance, good mechanical properties, first-class electrical properties and unique low friction and non-stick characteristics.

The polymer is available as a granular white powder which can be fabricated by special techniques into a variety of forms —block and rod, extruded sleeving and cables, gaskets and packings, bearings and valve bases, film, and many others. These are all available from trade fabricators in this country.

## CANNING QUARTERLY NEWS

THE current issue of this well-known house magazine marks a change in size and method of presentation. It is stated by the sponsors that the new format was decided upon as part of a policy of making it a live and useful works magazine.

The current issue contains a report of the recent visit of Sir Ernest Canning to South America, reports on the firm's two stands at the recent B.I.F., photographs of H.R.H. The Duke of Edinburgh greeting the chairman, Sir Ernest Canning, at the B.I.F. and Mr. Duncan Sandys (Minister of Supply) inspecting the firm's products at the "Made in England" Exhibition at Zurich in June.

Other articles are concerned with the reminiscences of Mr. S. S. Dawson after forty years in the plating trade, and a report by Mr. W. L. Davies on the old Bagot Street factory which was first started up in the early days of this century.

**FIRE!**
**TRAGEDY AVERTED BY**
**NU-SWIFT!**
"Escape seemed impossible ... chemical machines spluttered and failed ... acid squirted by one just missed my eyes ... but reliable, non-damaging Nu-Swift saved us all."
NU-SWIFT LTD · ELLAND · YORKS
*In Every Ship of the Royal Navy*

## MARKING OF CONTAINERS OF HAZARDOUS CHEMICALS

THE Association of British Chemical Manufacturers has issued a booklet, *Marking Containers*, which outlines a system of warning labels for hazardous chemicals. It is intended to warn handlers and users that some products need special care. It applies only to this country, and primarily to chemicals passing in quantities exceeding six pints for liquids and 8 lb. for solids, up to and including the time the container is opened for use in the premises of the recipient. Specimen wording is given for labels for a first list of over 200 chemicals; wording for products not yet included can be worked out from the general principles and standard phrases described in detail. The information given on the labels includes the name (or other description), warning word, nature of hazard, precautions required, and accident or first-aid action. The scheme has been approved by the council of the association and recommended for adoption by all members. The Chief Inspector of Factories has welcomed the scheme and recommends it for adoption as a code of practice by all chemical manufacturers.

Copies of the booklet can be obtained from the association, at 166 Piccadilly, London, W.1, price 7s. 6d. net, post free, *cash with order*.

## COUNCIL OF INDUSTRIAL DESIGN, EIGHTH ANNUAL REPORT

THIS Report for 1952-3 is published by the Council, of Tilbury House, Petty France, London, S.W.1.

In the introduction it is pointed out that this has been a year of consolidation and reorganisation following the achievements of the 1951 Festival of Britain.

On the financial side the Grant-in-Aid received from the Board of Trade was £100,000. A balance of £1,292 was brought forward from the previous year, of which £1,000 was earmarked for outstanding Festival of Britain expenses. This sum was not required, since various Festival of Britain disposals, less expenses, produced a new balance of £2,455. A total of £3,455 was therefore refunded to the Board of Trade.

The council expended £119,996 during the year and received £20,302 from the sale of publications, exhibition receipts and other projects, making a net total expenditure of £99,694 (including a net expenditure of £16,309 by the Scottish Committee). A balance of £598 was carried forward.

The rest of the report is devoted to an illustrated review of the work of the council.

## NEW DIE GRINDER KIT

IN introducing a new die grinder kit (type DG1), Wolf Electric Tools Ltd., are satisfying the long felt need for a handy versatile tool at low cost to undertake a great variety of jobs in every tool room, machine shop and maintenance department. The extremely powerful driving unit which possesses abundant speed and power, has a capacity for grinding wheels up to $1\frac{5}{8}$ in. dia. × $\frac{5}{16}$ in. and has a speed (running light) of 16,000 r.p.m.

Its nett weight is 5 lb.; although primarily intended as a portable tool, it may with advantage be mounted in a bench clamp stand for stationary use.

Dust-sealed ball bearings are used throughout and the double pole switch is of ample capacity and is fitted with a retaining button. Armature and field windings are enamelled and double silk covered copper wire, and the armatures are dynamically balanced to precision limits by electronic methods.

The complete kit comprises the high-speed DG1 grinder with 10 ft. of three-core T.R.S. cable, spare set of carbon brushes, a carefully chosen set of mounted points, grinding wheels, and felt

bobs and arbors completely housed in a specially designed steel carrying case. This useful outfit provides an efficient method for grinding down contours, correcting inaccuracies in dies, light profile grinding, retouching taps, cutters and forming tools, etc. A wider selection of rotary files and milling cutters for use on non-ferrous metals is available to suit special requirements.

---

**Tin and Its Uses No. 28**

The current issue of the above publication contains several interesting items; there is a report on the recent applications of tin-nickel alloy plating, an article on copper-nickel-tin coining alloys and some information on the manufacture of miniature Coronation bells, *Tin and its Uses* is available free of charge from the Tin Research Institute, Fraser Road, Greenford, Middlesex.

---

**"The Filtration and Pumping of Plating Solutions,"** is the title of a new publication by *Electroplating and Metal Finishing*. Written by G. T. Colegate, the booklet contains basic information on filter aids, activated carbon bags and diaphragms, valves, pumps and the effects of suspended matter. Priced at 7s. 6d., it is well illustrated with photographs and diagrams.

---

## READER SERVICE

HOW many times, reading through your copy of "INDUSTRIAL FINISHING," have you come across an item worth following up? A brochure about a new method, a catalogue of equipment in which you are interested, a data sheet on some new method of processing or, perhaps, just a simple reprint from a technical paper. Whatever it is, the sequence of events is usually the same. You make a mental note to write for it, perhaps you go further, and jot down the names of about five or six items in the issue, but how often does the job get carried to its conclusion? how often do you forget, or put it off because you are busy? How many interesting and possibly profitable things do you miss?

When an item appears in "INDUSTRIAL FINISHING" the name and address of the firm concerned is always given if it is known to us. The reader pays for his journal and is entitled to this information. In order to extend the scope of our service to readers, this special "Reader Service Card" was introduced and by its use selected items can be obtained direct without having to write to several different manufacturers. We hope that the use of this system will save the time of readers and constitute a convenient and quick method of obtaining information.

True to our standards as outlined above we are still publishing the names and addresses of all the manufacturers concerned, readers may, if they wish, get in touch with them direct but the idea of the service card is to save time and trouble. In addition to the special section described, we are, of course, always ready to help with your special queries as before. The experience of our editorial staff is at your service and it is up to you to make use of it.

*The Reader Service Card will be found facing page* 136.

---

MR. DUST DEVIL
IS LOSING HIS WINGS

That dust which floats around in the air in your spraying or dipping shop will settle on articles awaiting processing. Make sure it is removed before treatment by giving all parts a quick flick over with an Adhesive Duster, thus ensuring the complete removal of all dust and lint. The result! A perfect finish on every article. Adhesive Dusters pay for themselves by reducing the number of rejects which come from the finishing shop.

ARREST HIM WITH

ADHESIVE DUSTERS
ST. JOHNS STREET · KATES HILL · DUDLEY
TELEPHONE: SEDGLEY 2327

# DECORATIVE PROCESSES

## 2—FINE LINING

*by* J. H. OUSBEY

THERE are two main methods of application for fine lining work. First the cut-in process where the line is scribed into the surface of the work accurately and usually by some mechanical means and then colour run into the channel so formed, and secondly the application of lines on the surface of the work with paint as the medium. On most work, that is work which cannot be done mechanically, the lines have to be applied after the job is otherwise completed. It is possible to apply fine lines by means of transfers and this will be dealt with in the article on transfer application. For the present we are concerned with hand applied lining and this, of course, excludes the lining which is put on by a small hand tool or machine.

It should be clear from the outset that fine lining is an expert process, but is one which can be learned and after some practice it is possible to become quite proficient in running lines using the special brushes called Lining Pencils. Such expertness is facilitated if the flow of work is of the same kind and it is possible eventually on repetition work to get to the stage when one can run a line without prior marking out. One of the features of modern lining which will help the novice is that fashions have changed and the old scrolls and corners and other elaborate lining devices are not now used. Lining tends to be severe in character and is usually confined to the edges of the job. For example, on safes and steel office furniture a line is usually run at distances of between ½ in. and 1 in. from the edge of the panel. When proficient with the tools such lining is comparatively simple to execute.

**Marking-out.** As it will be necessary to mark out in nearly all cases, and especially in the early days of one's experience, the following notes on setting out will be found helpful. Chalk is nearly always used for marking out because it is usually washed off afterwards and does not permanently mark the paintwork. For long runs of lining, that is where the actual line is of considerable length, a fine chalk line will be found sufficient and this is applied in the signwriter's fashion of snapping a chalked cotton line. It is self-evident that the chalk marks which appear on the work must be as thin and light as possible so as not to impede in any way the paint when applied. For the benefit of those who have not seen a chalk line applied in the signwriter's fashion the method is as follows: Select a piece of cotton, crochet cotton is the best, and tie a loop in the centre of the length. Next run a stick of chalk along it so that the chalk powder adheres to the cotton. The line is now held at the appropriate points and the loop in the line pulled back and released smartly. This operation, of course, implies the assistance of another person and when assistance is not available it is usual to take the loop between the teeth for the purpose of pulling away.

Marking out which calls for short lengths of line at angles or with radiussed corners follows a different procedure. A pair of steel dividers is used and set to the correct distances, assuming that one leg of the dividers is to be run against a suitable guide, usually the edge of a panel or a moulding or other suitable erections or depressions. A small piece of brown paper size 6 in. by 3 in. is rubbed with chalk on the rough side and the method of marking from now on is merely to run the dividers along the area to the line holding the brown paper chalk straight to the work, underneath the free leg of the dividers. The dividers, of course, are only free to run along 6 in. at a time when the chalked paper is moved as the work

# ONE COAT — ONE PROCESS

**AIR DRYING & STOVING HAMMER FINISHES**

(NO SPECIAL APPARATUS REQUIRED)

★ APPEARANCE

★ DURABILITY

★ ECONOMY

★ EASE OF APPLICATION

USED BY LEADING MANUFACTURERS
OF MACHINERY, PRECISION INSTRUMENTS, INDUSTRIAL
& DOMESTIC EQUIPMENT FOR THE PAST TWO YEARS

*Samples and prices from the Manufacturers*

**A. LEARNER & CO. LTD**

WHARTON STREET, NECHELLS, BIRMINGHAM 7

*Telephone: East 0410 and 0419*

MANUFACTURERS OF CELLULOSE AND SYNTHETIC
LACQUERS AND ENAMELS FOR ALL PURPOSES

proceeds. This is much simpler in operation than it sounds from the description and results in a clear thin line which is as accurate as a guide against which the dividers are held.

Another way of marking out which would be extremely useful for repetition work would be to make a "pounce." This involves a sheet of paper of the exact size of the complete area of the work. The lining is set out in pencil on the paper and holes are pricked with a thick needle at $\frac{1}{4}$ in. distances exactly in the centre of the pencil lines. The paper should be a stout kind. After the holes are pierced the paper is turned over and the rough edges of the perforation taken off with a piece of sand-paper. Next a pounce bag is made. This consists of a thin muslin bag containing powdered whiting and other suitable powder for light colour ground lime or yellow ochre when necessary. The completed pounce is held against the lines when the chalk or other powder will appear through the holes giving one a complete marking out of the lining positions without any further trouble. Naturally it would be necessary to ensure that there is accurate registering of the edges of the pounce against the work, a slight error will throw the whole thing out of position.

**Running a Line.** The first thing is to prepare the colour. For modern finishes such as cellulose or synthetic enamels it is best to use synthetic undercoat enamels for the lining, as these do not normally need protection afterwards providing the finish is waxed when dry. The paint should be well mixed and strained. This is very important as it is evident that one cannot run a smooth and continuous line if the paint is at all lumpy. The appropriate thinner should be kept at hand in a separate container and this is added to the colour as it thickens on the palette. It is not normally possible to prepare paint of the correct consistency before the lining commences. One gets accustomed to the feel of the correct paint consistency when drawn against the palette. The brushes used are known as Lining Pencils and these are long haired brushes set in quite a small ferrule or handle which is held between the fingers. The length of lining pencils vary from 2 in to 3 in. and it will be immediately appreciated that such brushes are not easy to manipulate, especially when first loaded with paint. The following description of running the line is, of course, the procedure when competence has been reached in handling the brush and in order to do this the writer would suggest that the tyro does have some hours of practice on any old panel. It is essential to use a palette which can be any piece of smooth wood or metal and even a piece of glass. A little of the colour is poured on the palette and the lining pencil worked into it carefully adding thinner with the point of the pencil until a workable consistency seems to have been achieved. Any excess paint on the lining is removed by running the brush across the palette on a place which has no paint and then the pencil is brought to the work, by laying it along the line and quickly running along in the direction of the marking line. The depression or projection which served as a guide when marking out will serve again now for a guide for the fingers of the hand which holds the tool.The lining pencil is held between the thumb and first finger, leaving the other three fingers available for running along the guide. Whilst the lining pencil is in operation for running a line almost the whole of it is used and only a small part of the heel of the brush is raised from the work. During lining the eye should attempt to follow the line ahead of the pencil, that is ahead of the direction in which it is travelling and when one can get into the way of doing this the system of lining will be found to be much easier. Contrary to expectations it is quite a simple matter to complete a line, all that is necessary is for the lining brush or pencil to be lifted smoothly from the work. To the unexperienced it is the commencement of the lining which presents most difficulties, it is sometimes found to be difficult to approach the work holding a loaded brush with any confidence.

Fine lining refers to lines from $\frac{1}{32}$ in. up to approximately $\frac{3}{16}$ in. in width. Wider lines than these sizes call for two marking out lines and a larger size of brush with which to do the work. For these larger sizes the

# MANDER'S
## INDUSTRIAL FINISHES

*Full technical description on request to*

MANDER BROTHERS LIMITED • WOLVERHAMPTON

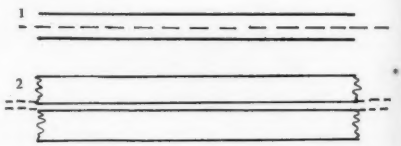
brushes are called "picking-out pencils" from the fact that their normal work is for the picking out of reliefs and mouldings.

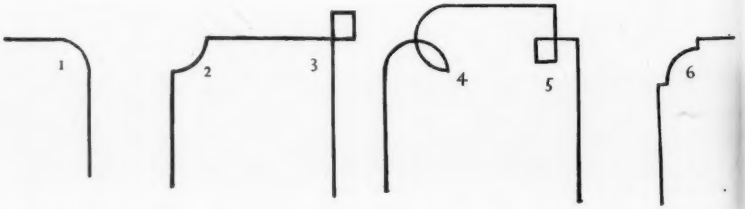
**The Picking-out of Reliefs and Mouldings.** This is one of those jobs which at first sight appear to be simpler than fine lining, but can be very tedious and sometimes difficult. It is seldom that a moulding forms a sharp edge against the panel and in order to avoid the contrasting paint leaving an untidy ragged edge it is usual to run a line an $\frac{1}{8}$ in. away from the paint where the moulding joins the completed portion of the work, otherwise paint may get in the groove and so make a ragged edge.

**Curved Works and Corners.** Even with the present day simple and austere design of lining work it will be necessary sometimes to use an elaborate corner or curve, and little can be said about technique here, practice alone will provide the experience. Our illustrations, however, will give some ideas for finishing corners.

**Masked Lining.** Where expert assistance and the correct equipment is not available fine lines may be put in with the aid of masking tape. This method is not so simple as would first appear. There are two snags. First that the application of masking tape may result in a line which stands proud of the surface, and secondly that pliable and flexible tape is not easy to run in straight lines for any length and can become quite difficult if one has to run two pieces of masking tape and leave a space of $\frac{1}{16}$ in. between. The writer suggests the following to get over such difficulties. Use 1 in. masking tape and mark out two lines to be $\frac{1}{2}$ in. on either side of where the finishing line is required. If 1 in. masking tape is now run between these two lines it should be possible to mark out in pencil on the tape the position of the desired $\frac{1}{16}$ in. line, then with a straight edge and a sharp stencil knife the masking tape can be cut down either side of the $\frac{1}{16}$ in. line, leaving this free and clean. Our second illustration shows this in different stages. Having assured one's self that the space between the masking tape is, in fact, clean and free from little bits of adhesive, the paint can now be run in the groove between the lines. When using this tape method for lining, the thinner the tape the clearer will be the line and if it is possible to use cellulose adhesive tape the results will be even better. If the line or design is to be put in by spraying it will be necessary also to further mask with paper.

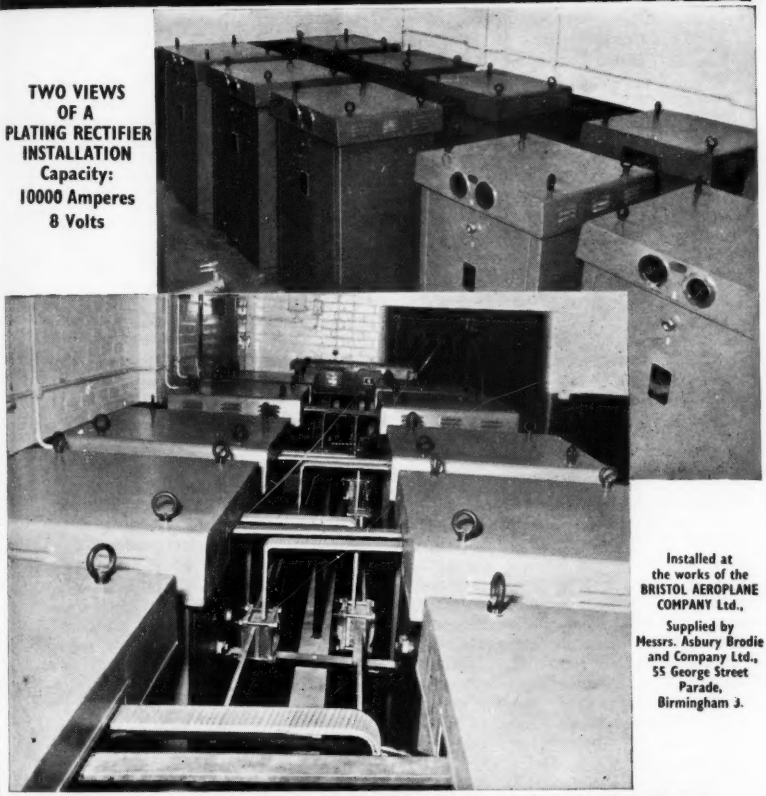
*Right: Method of lining with masking tape, snap chalk line for position of line, then two lines to take masking tape. Fix tape between lines and mark out two lines for cutting. Cut between these with stencil knife. For spraying lift edges of masking tape and add paper as further masking protection.*
*Below: Six methods of forming corners on panels.*



# RECTIFIERS FOR ELECTROPLATING

TWO VIEWS OF A PLATING RECTIFIER INSTALLATION
Capacity:
10000 Amperes
8 Volts



Installed at the works of the BRISTOL AEROPLANE COMPANY Ltd.,

Supplied by Messrs. Asbury Brodie and Company Ltd., 55 George Street Parade, Birmingham 3.

—SO TO CONVERT THE HIGHEST PROPORTION OF AC MAINS (EVERY UNIT OF WHICH MUST BE PAID FOR) INTO A SMOOTH & CONSTANT DC SUPPLY FOR THE PLATING VATS SPECIFY ECC.

*Ask for Brochure B. 1365—"More Efficient Plating"*

ESTABLISHED 1882

THE ELECTRIC CONSTRUCTION COMPANY LTD.

Head Office and Works:
BUSHBURY ENGINEERING WORKS
WOLVERHAMPTON
ENGLAND

TELEGRAMS: ELECTRIC WOLVERHAMPTON

TELEPHONE: WOLVERHAMPTON 21455 (7 LINES)

2628

*Manufacturers of Rotating Electrical Machinery, Switch and Control Gear, Rectifiers and Transformers.*

# Corrosion of Low-Alloy Irons and Steels in Soils

THE extensive use of low-alloy high-strength steels in many kinds of above-ground construction is based largely on the fact that these steels corrode more slowly than plain carbon steels under most atmospheric conditions. Unlike steels containing high percentages of alloying metals, low-alloy steels are not inherently resistant to corrosion. Instead, they owe their corrosion resistance to the development of an adherent layer of corrosion products, which reduces further corrosion to a negligible or at least tolerable rate. Since these protective deposits develop normally under conditions of good aeration, the usefulness of low-alloy steels as a class for underground construction would seem to depend on their ability to develop and retain protective deposits under the conditions of deficient aeration which are characteristic of corrosive soils.

A recent study by the National Bureau of Standards in America provides new information on the corrosion of certain low-alloy irons and steels in soils. Specimen plates of several of these materials (containing up to about 6 per cent. of total alloying elements) together with reference specimens of plain steel were buried at fifteen different test sites for periods up to thirteen years.

Included in the study, which was conducted by I. A. Denison and M. Romanoff of the NBS corrosion laboratory, were specimens of copper-molybdenum open-hearth irons, nickel-copper steels, and chromium steels with and without molybdenum. Sets of specimens were removed at regular intervals over the thirteen year period, and after removal of corrosion products the weight losses and depths of the deepest pits were measured.

The steels containing 4 per cent. to 6 per cent. of chromium generally lost only about half as much weight as did plain steel under the same conditions. However, the greater corrosion resistance of the alloy steels as measured by weight loss was not generally accompanied by a corresponding reduction in the maximum depth of pits. The least pitting was observed on specimens that contained molybdenum in addition to chromium.

The change in the rate of pitting with time was found to depend on the composition of the steel. Although the initial rate of pitting was greater for the alloy steels the depths of the deepest pits in the alloy steels were usually less than in the plain steel. This indicates that after the maximum period of exposure the alloying constituents induce the formation of corrosion products which tend to reduce the rate of pitting with time. In an environment unfavourable to the development of protective deposits of corrosion products, the alloy steels could be expected to develop deeper pits than plain steel because the greater initial rate of pitting of the alloy steels would tend to be maintained. This tendency toward accelerated pitting of alloy steels was actually observed in a few highly reducing soils in which the deposition of a protective scale was impossible because of the solubility of the corrosion products.

Provided their corrosion resistance in a prospective environment is sufficient, low alloy steels may be of interest for certain applications because of their high strength. The NBS study indicates that alloy steels may, in some cases, be appropriate choices for certain types of underground construction, such as piling, in which mechanical strength, rather than ability to contain a fluid indefinitely without leakage, is of primary importance. However, whether the superior properties of an alloy steel justify its higher initial cost should be given due consideration.

# PERSONAL READER SERVICE SECTION

*Items in the following list of manufacturers' literature are available as a personal service to readers of* INDUSTRIAL FINISHING *by using the reply card below.*

*In addition, the editorial staff of* INDUSTRIAL FINISHING *are always available as an advisory service on questions affecting finishing.*

**Gas Carburising**, with special reference to the treatment of substitute steels, the publication gives a detailed survey of an actual installation covering plant layout, handling methods, metallurgical considerations, working capacities; the material is reprinted and forms a most useful survey. The Incandescent Heat Co. Ltd., Cornwall Road, Smethwick, Birmingham. (90)

**Portable spray Painting Outfit,** compressor weighs less than 20 lb. Complete outfit in carrying case comprises: spray-gun, container, gauge, hose, cable, and compressor, to 3·5 c. ft. per min. capacity and 35 to 40 p.s.i., universal A.C./D.C. motor. Leaflet gives full details and illustration. International Engineering Concessionaires Ltd., 192 Sloane Street, London, S.W.1. (91)

**Degreasing**, a jet-spray system employing a detergent compound, heated for use and applied by an electrically-driven unit. The method places the articles for treatment into the unit, within which a pump rapidly circulates the solution following which the dirt, etc., is filtered. The folder describes the equipment and its operation and gives specification details. Arthur L. Haigh and Co., Middlegate Works, Birstall, Yorks. (92)

**Air Filtering,** a dry-type electronic appliance, employing the principle of a powerful electrostatic charge to a special filter material, converting the fibres into collecting electrodes. A detailed description is available with illustrations and diagrams; capacities and dimensions are also given in the folder. Air Control Installations Ltd., Ruislip, Middx. (93)

---

**CIRCLE ITEMS YOU DESIRE**

**CUT OUT AND POST THIS CARD**

## INDUSTRIAL FINISHING

157 HAGDEN LANE, WATFORD, HERTS.

I should like a copy of each piece of Manufacturers' Literature specified by number circled below.

NOTICE: Students and other than United Kingdom subscribers should request literature directly from manufacturers.

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | |
| 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | |
| 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | |
| 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | |
| 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | |
| 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | |
| 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | |
| 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | |
| 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | |
| 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | |
| 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | | | | |

**PLEASE PRINT**

Name _____ Position _____

Firm _____

Address _____

## READER SERVICE

**Copper,** a technical survey covering production, fabrication, finishing and plating, properties and applications, corrosion and productions, etc. This survey is No. 2, July, 1953, issued under the title *Technical Survey*. The booklet. with its varied contents, covers 32 pages, and is available on request. The Copper Development Association, Kendals Hall, Radlett, Herts. (94)

**Hot Spray Painting,** operating methods and equipment explained in detail with illustrations and diagrams. The literature describes a unit of new design including the heater, its ancillary equipment, and the gun. The Aerograph Co. Ltd., Lower Sydenham, London, S.E.26. (95)

**Degreasing and Metal Cleaning;** degreasing methods and material are surveyed, including dormant immersion, agitated immersion, electrolytic immersion and rotating barrel method. Particular solutions are described and applications suggested. B.H. Chemicals Ltd., Merton Abbey Laboratories, Merton Road, London, S.W.19. (96)

**Phosphating and Paint Bonding,** the Fasbond process. A recommended immersion process for the bonding of paint to steel, operating at temperatures between 40° C. and 70° C. Bath may be put into use immediately after making up and can be maintained in strength, by the addition of a second solution, whenever its efficiency starts to fall off. Data sheet and working instructions. The Walterisation Co. Ltd., Purley Way, Croydon, Surrey. (97)

**Non-Staining Dip,** for electroplating processes; claimed to prevent fingerprint corrosion and staining by a simple dip after the final bath. Displaces water from the final rinse, eliminates sawdust drying and tumbling, and prevents oxidation and discoloration in storage. Details in a leaflet. Ault and Wiborg Ltd., Standen Road, Southfields, London, S.W.18. (98)

**Direct Reading Portable Hardness Tester,** 120° cone diamond indenter giving readings on the Rockwell A, B, C, F, G, E and K scales according to requirements. The hydraulic unit is not subject to variation due to climatic conditions. Descriptive leaflet. C. Tennant and Sons Ltd., 4 Copthall Avenue, London, E.C.2. (99)

**Hot Spray Finishes,** booklet giving details of types and formulations available, descriptions of the advantages and methods of using. Thos. Parsons and Sons Ltd., 70 Grosvenor Street, New Bond Street, London, W.1. (100)

(*Continued on page* 138.)

---

**Circle items you desire on reverse side, cut out and post this card.**

**Postage will be paid by Licensee.**

**No Postage Stamp necessary if posted in Great Britain or Northern Ireland.**

**BUSINESS REPLY CARD**
**Licence No. WDB. 55**

RECORDS DEPARTMENT
ARROW PRESS LTD.,
157 HAGDEN LANE,
WATFORD, HERTS.

# WATER WASH SPRAY BOOTHS *of* GREATER SIMPLICITY *and* HIGHER EFFICIENCY

There are no pumps, nozzles or filters to choke or need attention. The only moving part is the fan, which handles the clean dry air from the high efficiency wash and discharges it to the atmosphere.

*We welcome enquiries for incorporating these advantages in proprietary booths. We can also offer the same advantages of clean exhaust with very little maintenance for DUSTS AND FUMES FROM POLISHING, GRINDING AND PLATING*

**DRUMMOND PATENTS (HOLDINGS) LTD**
5 GREAT WINCHESTER STREET, LONDON WALL
LONDON, E.C.2
*Telephone: LONDON WALL 4432 & 2626*

To obtain literature appearing on these pages, please refer to easy-to-use reply card facing page 136.

**Fused Silica Immersion Heaters,** available from stock in 1 to 5 kW. sizes for operation at 200-250 v. Widely used by operators of pickling and plating installations because of ease of fitting and the fact that the fused silical sheath does not contaminate the solution. Over-all lengths from 10 in. to 60 in. according to rating. Details and questionnaire for deciding suitable sizes, in a leaflet. The Thermal Syndicate Ltd., 12-14 Old Pye Street, Westminster, London, S.W.7. (101)

**Industrial Skin Soap,** for the prevention of cyanide and chrome sores, nickel itch and industrial dermatitis. Specially prepared for the plating and pickling operative. Leaflet No.3338. Canning and Co. Ltd., Great Hampton Street, Birmingham 18. (102)

**Red Oxide Metal Priming Paint,** having a flat finish suitable for high anti-corrosive and rust inhibitive painting systems. Claimed to be surface dry in 2 hours and handle-proof in about 4 hours. If necessary it can be repainted in about 7-8 hours. Folder gives details and application instructions. Croda Ltd., Snaith, Goole, Yorkshire. (103)

**Roll-on Marking Device,** a self-inking printing roller mechanism which takes the place of the usual rubber stamp. It has detachable and replaceable type which can be purchased in sets. The type is fitted into ribbed slots thus enabling different type sizes to be combined in one setting. Will print on sacking, wood cardboard, metal, plastics and textiles materials. Explanatory leaflet and price list together with specimen type sheets. Mark-O-Print, Ltd, (Marking Division) Station Path, Putney Bridge Station, Fulham, London, S.W.6. (104)

**"Bouncing Putty,"** a highly viscous fluid which has rubber-like characteristics. It can be dropped or thrown on a hard surface and will shatter, yet it can be readily shaped by kneading and pressing, it can be elongated by pulling slowly and is highly resistant to sudden stresses, thus it can be used for a variety of new applications. Cost about 1s. per lb. in quantity. Data sheets and full particulars in leaflet. Midland Silicones Ltd., 19 Upper Brook Street, London, W.1. (105)

**Non-Slip Surfacing Sheet,** claimed to be the answer to oily floors and wet, slippery conditions. Supplied in pressure sensitive, self-adhesive strips or sheets for application to stairs, passages, step ladders, etc. Folder and details. Minnesota Mining and Manufacturing Co., Ltd., Arden Road, Adderly Park, Birmingham 8. (106)

**Vibro-Electric Equipment,** high frequency vibration generating units with a frequency of 6,000 impulses per minute on unrectified A/C current and 3,000 per minute on half wave rectified supply. Used for jogging, shaking, vibration chute feeding, etc. Booklet with diagrams and examples of possible uses, Podmores (Engineers) Ltd., Pynest Street, Stoke-on-Trent, Staffs. (107)

**Use of Silicon Esters as Bonding Agents,** a profusely illustrated booklet from Monsanto Chemicals Ltd., describes and illustrates the use of their "Silesters" in the development of the lost wax method of casting, the manufacture of precision piece moulds, the production of permanent ceramic moulds and the linings of high frequency furnaces. Monsanto Chemicals Ltd., 8 Waterloo Place, London, S.W.1. (108)

**Safety Steel Flooring,** Rodlock steel flooring is produced by an arrangement of mild steel bars pierced at regular intervals by transverse rods, pressed and locked into a U-shape. The material is designed as flooring for garages, power stations, pickling plants and similar conditions demanding a tough, safe floor. Data sheet. Chamberlain Industries Ltd., Staffa Works, Leyton, London, E.10. (109)

**Insulating Varnishes,** a range of impregnating and insulating varnishes for the electrical industry is described in a small booklet. Specification numbers and characteristics are given. Thos. Parsons Ltd., 70 Grosvenor Street, New Bond Street, London, W.1. (110)

*p*H **Measurement,** direct reading, portable and transmitting meters for the measurement of *p*H values are described in a broadsheet which also describes many other types of electric and electronic meter instruments. Electronic Instruments Ltd., Red Lion Street, Richmond, Surrey. (111)

To ensure maximum benefit from this feature, manufacturers are asked to send a specimen of any new literature they think suitable for inclusion.

**S**HOW THIS TO YOUR PLATER

**E**ASY ON THE OPERATOR

**N**EGLIGIBLE MAINTENANCE

**I**NTRODUCING DIRECT GEARED MOTOR DRIVE AND 2 SPEEDS

**O**UTCOME OF MODERN ENGINEERING DESIGN

**R**ELIABLE IN PERFORMANCE AND STRENGTH

CRUICKSHANK'S

## NEW DESIGN SENIOR PLATER

INCORPORATING 2 SPEEDS

This machine has been specially designed to suit many of our customers who have the need for a two-speed plating barrel instead of a fixed speed.
In all other respects it is similar to the standard Senior Plater—see illustration opposite.
These new model Senior Platers are offered to Industrial Platers with every confidence.
There are no belts to wear, slip or break; no belt guards and no awkward raising and lowering operations.

Standard fixed Speed Model.

CRUICKSHANK'S

**R. CRUICKSHANK LTD**
CAMDEN STREET, BIRMINGHAM, 1

Phone: CENtral 8553 (6 lines)
Grams: Cruickshank, Birmingham

**Epikote Resins,** the toughness, flexibility and resistance to chemicals, abrasion and water, of the Epikote, resin-based finishes described in a booklet. Grades, purposes and methods of using resins in the surface coating industry are given in some detail. Shell Chemicals Ltd., Norman House, 105-109 Strand, London, W.C.2. (112)

**Silica Refractories,** chemical and physical data, tables showing composition, range and physical properties, approximate weights and technical reference data. Booklet. General Refractories Ltd., Genefex House, Sheffield 10. (113)

**Multi-Purpose Brush Strip,** circular, flat and spiral brushes are made up from this strip material to suit individual jobs. Used in the production of vacuum cleaners, glass washing machinery, envelope sealing, stamp cancelling, etc. Leaflet/folder. Kleen-E-Ze Brush Co. Ltd., Hanham, Bristol. (114)

**Robot Incinerator**, a range of refuse incinerators for the disposal of non-salvagable waste materials. They are available in several sizes and types from 2·75 c. ft. to 30 c. ft. capacity. Illustrated folder. Riley Stoker Co. Ltd., 19 Woburn Place, London, W.C.1. (115)

**Thermostats,** temperature sensitive stem-type thermostats for the control of liquid temperature in water and industrial process tanks, etc., data sheet, No. 103. The Rheostatic Co. Ltd., Slough, Bucks. (116)

**Surface Thermostats,** designed to control the surface temperature of any surface to which the base is clamped. Single pole switch mechanism and self-resetting feature (can be arranged for manual reset). Data Sheet No. 106. The Rheostatic Co. Ltd., Slough, Bucks. (117)

**Pressure Switch,** using a snap action micro-gap switch, operated by a bellows unit. This is suitable for inclusion in a system of control for steam, oil, gas or air at pressures up to 275 p.s.i. Data sheet No. 115. The Rheostatic Co. Ltd. Slough, Bucks. (118)

**Silver Plating Materials.** Consistent success and economy in silver plating depend to a very great extent on the physical and chemical condition of the anode employed and on the plating solution. A folder describing the Matthey, new process, silver anodes and plating salts, contains basic information for using the materials and making up the baths. Johnson, Matthey and Co. Ltd., Hatton Garden, London, E.C.. (119)

**Shrunk-on Sleeves and Coatings,** a new process for fitting sleeves and shrunk-on plastic covers to tools, handles, piping, rails, etc., no cement or adhesive is used and the coverings are permanent. They follow the contour of the product and can be supplied in a wide range of colours. Lacrinoid Products Ltd., Gidea Park, Essex. (120)

**Electronic Temperature and Humidity Control,** the Tem-Con system is easily adapted to respond to very small movements of the control unit and changes of pressure, linear dimensions, humidity and liquid level can be detected and a mechanism actuated to correct the position or give a warning. Folder. P.A.M. Ltd., Merrow, Guildford, Surrey. (121)

**Recording Thermometers**, wall or flush-mounted, single, double or multiple pen recorder charts, folder and data sheet, gives diagrams of possible installation methods, descriptions of operating systems and illustrations of the various types. Bulletin T.E. 800. Bristol's Instrument Co. Ltd., Lynch Lane, Weymouth, Dorset. (122)

**Cellulose Finishing,** recommended procedure, practical advice on overcoming difficulties, step-by-step instructions for the application of each coat. A booklet issued by Thos. Parsons Ltd., gives all the above, together with a list of faults and how to avoid them. Thos. Parsons Ltd., 70 Grosvenor Street, New Bond Street, London, W.1. (123)

**Decorative Plywood and Shadow Wood.** Methods of using, paint and varnish finishes, natural finishes, stain wax, etc., instructions for the use of these special plywoods. (Bulletin No. T., Finish 2.). A. Noyek and Sons Ltd., 200 Parnall Street, Dublin, and 7 Cook Street, Cork, Eire. (124)

**Chain Conveyors,** unrestricted movement in the horizontal and the vertical plane is one of the principal features of the Teleflex system, the dual directional chain, based on a new design, has enabled many conveyor problems to be solved. The conveyor is adaptable to travel round corners, up and down in the vertical, and can be set at any angle to the horizontal. An eight-page brochure describes the system, and illustrates the various component parts. Teleflex Products Ltd., Teleflex Works, Chadwell Heath, Essex. (125)

**Cable Conveyors.** Following the success of the Teleflex cable conveyor based on a ½ in. dia. cable, the makers have now introduced a new range of conveyor cables and fittings based on a diameter

A TOUGH DURABLE FINISH . . .

The Enamel that COVERS in ONE-COAT

SNAPPOL SYNTHETIC ENAMEL

Send for a sample of 'SNAPPOL' and prove it yourself !

NO PRIMING OR UNDERCOATING NECESSARY TO OBTAIN 100% ADHESION

FULL GLOSS AND SOLID COVER WHEN APPLIED DIRECT TO BARE METAL

AIR DRIES IN 40 - 50 MINUTES

STOVES: INFRA-RED 3 - 4 MINUTES

CONVECTION OVEN 10 MINUTES

Joochow INDUSTRIAL FINISHES

DONALD MACPHERSON & CO. LTD. INDUSTRIAL FINISHES DIVISION
CHURCH ROAD, MITCHAM, SURREY—21 ALBION STREET, MANCHESTER 1

of 0·705 in.; this has been called the "705" system. Flexibility is claimed to be even greater than with the original system and it is eminently suitable for long runs with multi-drives. An eight-page brochure describes the system and demonstrates, by means of exploded diagrams, the operating principles of the various parts. Teleflex Products Ltd., Teleflex Works, Chadwell Heath, Essex. (126)

**Oil-Fired Suspended Heaters for Factories.** An indirect-fired, gas tight construction is a feature of the heater described in the leaflet issued by Harris Engineering Co. Ltd. It gives full details and operating data on the heaters and describes the construction. Harris Engineering Co. Ltd., Browning Street, London, S.E.17. (127)

**Unit Heaters,** the design of the Spiral Tube unit is described in a folder which gives constructional details of several different types of suspended heater for factory and similar premises. The leaflet also describes a steam turbine driven model which does not require the usual electric motor drive and wiring, and is thus more flexible in the matter of siting, etc. Spiral Tube and Components Co. Ltd., Osmaston Park Road, Derby. (128)

## NEW COLOUR-CORRECTED MERCURY FLUORESCENT LAMPS

A RANGE of new Osram colour-corrected mercury vapour discharge lamps became available on 1st September, in 80-watt and 125-watt ratings. These lamps employ an entirely new fluorescent powder and their colour appearance and colour rendering properties show a substantial improvement over their predecessors. The powder itself has an attractive white body colour and provides an increased red ratio of 7 per cent. Its improved temperature stability has enabled the outer bulbs to be reduced in size to that of the standard Osram mercury lamps of the same wattages.

The new Osram 125-watt lamp is available with either the G.E.S. or the three-pin bayonet cap. The 80-watt lamp has a three-pin bayonet cap. Thus these better-colour lamps can be used in place of the earlier mercury fluorescent types or, by virtue of their reduced bulb size, substituted for 80-watt or 125-watt mercury pearl lamps.

The list prices of both Osram mercury-fluorescent lamps have not changed from £2 8s. 6d. for the 80 watt and £2 19s. 0d. for the 125-watt size.

# American Finishing Developments

A DIGEST OF THE ARTICLES DEALING WITH FINISHING PROCESSES, WHICH HAVE BEEN PUBLISHED IN U.S.A. TECHNICAL JOURNALS.

### Ethylene-derived Wax-like Polymer has Many Possible Uses

A wax-like polymer, called "Alcowax" and derived from ethylene, is being produced in limited quantities by the Allied Chemical and Dye Corpn., New York. Because it is resistant to water and chemicals, tasteless, non-toxic, substantially odourless, has good electrical properties, and is compatible with most other waxes and wax-like materials, it promises to have many uses. Among these may be mentioned a substitute for carnauba wax in polishes and wax emulsions; a substitute for stearate lubricating aids in processing plastics; a flatting agent for varnishes and other coatings; a water- and chemical-resisting coating for special papers, paper cups, and dishes, bread wraps, milk cartons and caps; a lining for metal containers; potting compound for electrical components; and as an ingredient of printing inks, leather finishing components, latex dispersions, strip coatings, and cosmetics.

The polymer is only slightly soluble in turpentine, petroleum naphtha, xylene, and toluene at room temperatures. At 180° F. it is soluble in xylene, toluene, trichloroethylene, turpentine, and mineral oils. It is practically insoluble in water at all temperatures, and only slightly soluble in methyl acetate, acetone, and alcohol up to the boiling points. Alcowax is miscible in all proportions with solvents boiling above 225° F.

Alcowax "M", still in the development stage, is a grade that is readily emulsifiable for introduction into such products as wax polish emulsions, leather finishes, textile sizes, glazing and embossing materials, latex dispersions, and water paints.

Alcowax "G", also in the development stage, has a low cloud point that offers better solubility, particularly in paraffin wax. It disperses more readily than other grades and is being evaluated for adhesion to metals, coating for electrical condensers, potting compounds, and collapsible tubes.

(*Chemical Processing. February,* 1953.)

### Pickling Solutions Heated by Submerged Combustion

A recently developed submerged combustion unit, using a graphite burner firing natural gas in highly corrosive solutions, maintains pickling baths at the required temperatures, with minimum control required, high efficiency, and long life. The transfer of heat is direct from the gas to the pickling liquid and is rapid and complete, resulting in high thermal efficiency.

A motor-driven blower or compressor provides combustion air to the burner at the required pressure, permitting combustion to take place beneath the surface of the liquid. The burner assembly is fabricated of graphite and is equipped with an electrical ignition system and the necessary safety devices in case of flame failure. Flow of air and gas can be controlled either manually or automatically.

The flow current throughout the pickling tank provides agitation and a scouring action on the surface of the part, thus producing a rapid pickling action. The burner is placed in a special brick-lined chamber which is inter-connected with the main pickling vat. Two connections are made to the vat; one near the bottom, and the other near the top. With the burner in operation, the products of combustion are released directly into the pickling solution. At the same time the gases bubbling up through the restricted burner chamber create an air lift effect, which sucks in the solution from the

QUIETER · SMOOTHER · MORE EFFICIENT · MODERN

*A product of Britain's foremost manufacturers of Polishing Shop equipment*

**MorrisFlex**

**NON-STOP POLISHING LATHE**
WITH INDEPENDENT SPINDLES

B. O. MORRIS LTD., BRITON RD., COVENTRY
*Telephone Coventry 5081-2-3* *Telegrams "Morisflex" Coventry*

lower opening and causes the discharge of heated solution at the top opening. This sets up a continuous flow within the vat—a great aid in pickling various items—and serves to maintain a uniform temperature throughout the bath.

(*Steel*, 15*th December*, 1952.)

**Butyl-impregnated Leathers**

A development in the leather industry is an improved tannery process involving the use of polyisobutylene as an impregnant. Developed by the National Bureau of Standards, Washington, District of Columbia, the process is reported to simplify treatment and to result in substantial savings both in material and time. It eliminates the milling operation required when rubber is used; it produces quality leathers with an improved abrasion and a water resistance equal to that of rubber, for shoes; and it is also particularly valuable for luggage, upholstery, book bindings, and similar fine leather products.

Impregnation with the butyl compound merely requires soaking the naturally porous leather in a solution of the polymer. The solution is prepared by dissolving polyisobutylene—with a molecular weight range between 50,000 and 100,000—in common solvents such as petrol, kerosene, benzene, or chloroform. After impregnation, the leather is removed from the solution, excess solvent wiped off, and any remaining moisture allowed to evaporate. A more rapid and uniform impregnation can be achieved in vegetable-tanned crust leather if the grain or hair side is split off to a depth of about 40 mils. prior to treatment. The method eliminates the milling operation required when natural rubber is used as the impregnant.

Research has showed that the method doubles resistance to abrasion and reduces water absorption by about one half, and is thus particularly suitable for treating shoe soles and upper leathers. Wear has been shown to be increased by as much as 80 per cent.

(*Leather and Shoes*, 17*th January*, 1953.

**Impregnation Method Prepares Sintered Parts for Plating**

A method of impregnating sintered metal parts for plating has been developed after two years of research by the American Metaseal Corpn., West New York, New Jersey. The method fills the voids permanently and invisibly so that parts can be plated successfully with no subsequent spotting out, freckling, blistering, or other corrosive reaction; makes parts pressure-tight so that they will hold pressures of over 5,000 lb. per sq. in.; and prevents internal corrosion under any conditions.

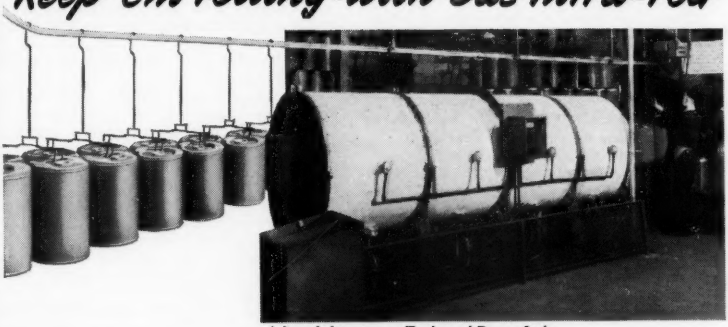
The system uses a thermosetting polyester-styrene copolymer (Metaseal 19V5). This plastic is inert, noncorrosive, and resistant to acids, alkalis, salt water, alcohols, glycols, gases, and all solvents. It has no effect on, nor is it affected by, any metal alloy. It withstands temperatures of from 75-400° F.

The parts are first degreased, if necessary, and pre-baked at 250-300° F. to remove all moisture from the pores. The parts are then impregnated with 19V5 in pressure vessels under vacuum and pressure so that complete pore penetration is attained. The impregnant is removed from all interior and exterior surface areas as well as from blind taps, threads, and channels, in a special emulsifying cleaning bath which does not remove the impregnant from the pores. The parts are cured at 250-300° F. to polymerise the impregnant in the voids. In the curing process, which was specially developed, there is no loss of the impregnant due to exudation or "bleeding."

Material cost is relatively low and one treatment is all that is normally required. The size, design, or complexity of the parts has no appreciable effect on the process or the cost. The process is identical and equally satisfactory for all ferrous and non-ferrous metals. Because Metaseal 19V5 is copper stabilised—a unique characteristic for thermosetting polyester-styrene plastics—it offers a new field to bronze powder metallurgy in making valve, pump, and other pressure components.

(*Precision Metal Moulding, January*, 1953.)

## *Keep 'em rolling-with Gas Infra-red*



*Acknowledgements to Tanks and Drums Ltd.*

This Parkinson and Cowan Gas Infra-Red Tunnel Unit is cutting a paint drying job from 1½ hours by older methods to 5 minutes — and is giving a better finish.
This form of 'Black Emitter Radiation' was started originally as a service to manufacturers in sheet metal. We now serve a wide range of industries from Fish Curing to the Textile Trade, and we are looking today for new problems to solve.

**PARKINSON & COWAN INDUSTRIAL PRODUCTS**

(A DIVISION OF PARKINSON AND COWAN LIMITED)

**DEPT. (U), COTTAGE LANE WORKS, CITY ROAD, LONDON, E.C.1**

*Telephone: Clerkenwell 1766/7*

IR.29


### Moulding Process Converts Scrap Leather Dust into Useful Products

A simple moulding process developed by the Plastics Research Co., Alhambra, California, transforms leather dust normally disposed of as scrap into usable products possessing many physical properties of tanned leathers. Based on the dispersion of adhesive powders with the leather dust, the process involves the use of a centrifugal mixer, and a compression press. It results in moulded leather-like sheets or parts.

The bonding ingredient consists of resins in available powder form, such as thermoplastic polymers, and B-stage thermosetting resins. Because of their macro-molecular dimensions and flow properties, dispersion of relatively small portions (twenty parts) of the resin powders with large portions (eighty parts) of leather dust will unite the leather molecules under heat and pressure to form products with the natural characteristics of tanned leather. Properties of the resulting product resemble those of the adhesive only with respect to flexibility. The resinous components may be pigmented prior to mixing, to obtain homogeneous colour effects.

The powder dispersions are converted by loading them in appropriate mould cavities and subjecting them to heat and pressure in the compression press. Temperatures around 300° F., and compressive forces ranging from 2,500-3,000 lb. per sq. in., are used to fuse the resin and leather components. Individual press operations require less than 5 minutes. A few simple trimming operations are usually required to remove flash or excess formations.

Shape and dimensional limitations are dependent only on the press and tooling equipment available. While dies of various types of metal can be used, tool steel is preferable for mass production. Silicone emulsions have been found to be most suitable as parting agents.

(*Leather and Shoes, 10th January,* 1953.)

# SOUTH AFRICAN NEWS

**From Our Special Correspondent in S.A.**

**New Factory for Coates Brothers.** A new factory for the manufacture of printing and industrial inks has recently been opened in Port Elizabeth by Coates Brothers and Co. (S.A.) (Pty) Ltd.

Coates Brothers started operations in South Africa in a modest way in Durban in 1936, successively establishing factories in Johannesburg and Cape Town, and the Port Elizabeth factory is now the fourth in the Union.

A very modern factory in Cape Town is to be followed by another in Johannesburg. A separate factory for the manufacture of liquid inks (aniline and gravure) and coatings for the metal decorating industry has recently been completed in Cape Town.

**Chemical Interests of Associated Company Taken Over.** Rolfes Ltd., well-known in South Africa as manufacturers of explosives and blasting accessories, have taken over the chemical and pigment interests of C. F. and H. Rolfe Bros. (Pty) Ltd.

New plant additions have been made for the manufacture of raw materials essential in the production of pigments, and the laboratory facilities of the plant have been increased.

Rolfes Ltd. intend to produce Molybdated Orange Chrome pigments in the near future, and also a new series of green shades based on Phthalocyanine Blue in combination with chrome yellows.

**Resoweld Being Made in South Africa.** Resoweld, a self-drying protective coating for exterior application to metal tanks, structures, beams, concrete and wood, for protection against corrosion due to spillage, acid fumes or oxidation, is now being made in the Uitenhage factory of the Goodyear Tyre and Rubber Co. (S.A.) Ltd.

**New Rust-proofing Solution.** A new rust-proofing solution known as "RS.1" is now being marketed by the Northfield Engineering (Pty) Ltd. of Port Elizabeth. The solution is brushed on to rusty surfaces which have not been proofed, converting the rust into a rust-inhibiting phosphate coating. Rinsing is unnecessary, surplus solution being wiped off with a damp cloth half-an-hour after application.

**Development of South African Paint Industry.** Speaking as chairman of the South African Paint Manufacturers' Association at the annual general meeting in Durban recently, Mr. T. W. Howard, general manager of Lewis Berger and Sons (S.A.) Ltd., expressed his belief that the paint industry was on the threshold of the greatest technical and scientific advances since the introduction of alkyd resins.

Conditions in the industry were not as active as a year ago, said Mr. Howard, but South African manufacturers had not suffered nearly as many reverses as the industry overseas. Import control had been of considerable value in assisting the industry to consolidate its post-war position, despite restrictions on raw material supplies which had prevented full advantage being taken of the absence of foreign competition.

---

# FIRE RESISTANT COATING FOR PIT WOOD

A SIMPLE and cheap coating solution for rendering pit timber resistant to fire has been invented by Mr. W. Guider, the Chief Scientist at No. 1 (Manchester) Area in the National Coal Board's North Western Division.

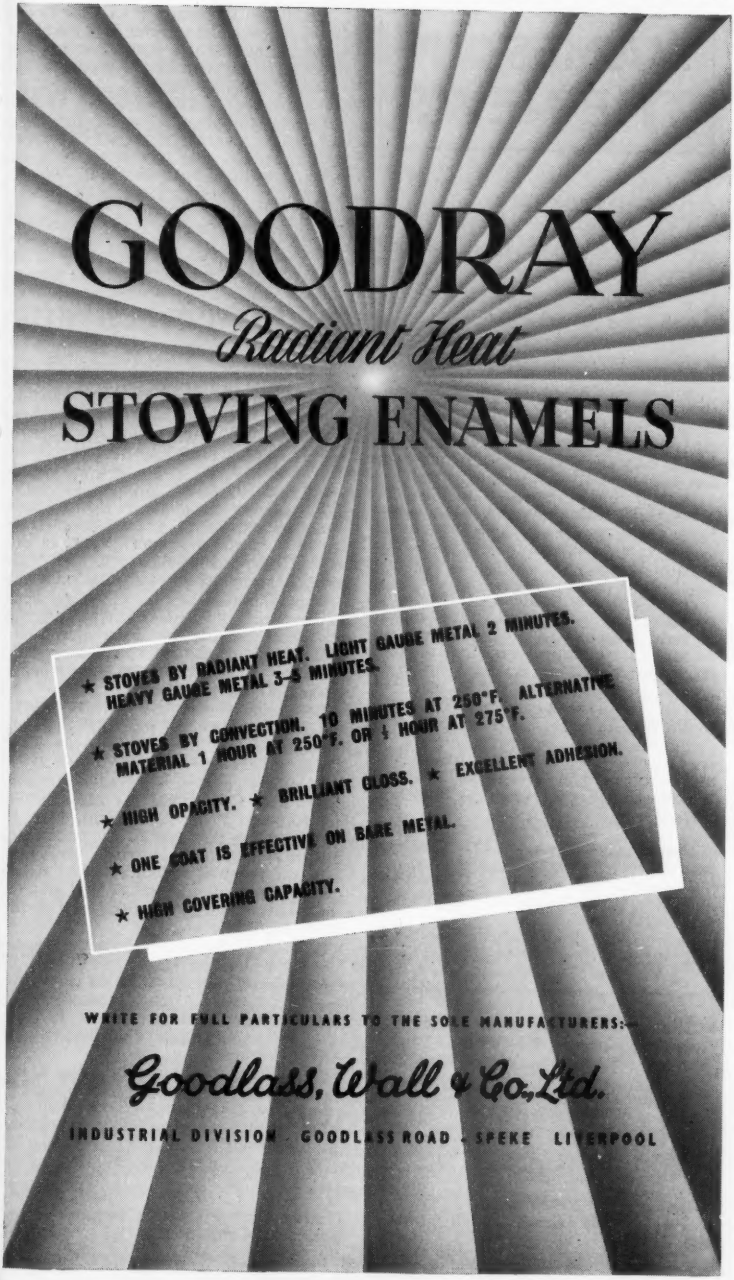
One of the major difficulties encountered was finding a coating which would adhere sufficiently well to timber exposed to the rapid drying conditions found in an intake airway, where the velocity of the air current is always high.

The problem was solved by mixing sand and ground limestone in equal proportions by volume and adding a solution of sodium silicate of 1·20 specific gravity in sufficient quantity to form a smooth cream. A typical building sand was used and the limestone dust is that normally used for stone dusting in the pits.

The coating, which can be applied by brush or spray, adheres well, dries quickly without deterioration and gives a light fawn-coloured surface which is very hard. A thickness of $\frac{3}{16}$ in. is sufficient to withstand normal heat tests.

The coating was tested by subjecting it for five minutes to the heat from burning diesel oil held in a tray 9 in. away. The test was unusually severe but the timber was untouched, although the protecting surface was too hot to touch.

*Note. Solutions of sodium silicate are alkaline and it is recommended that operators be provided with eye goggles and rubber gloves and clean water be available for washing. The inventor considers that the hazard is limited and well known as this substance is used in the household as a preservative for eggs.*


GOODRAY
Radiant Heat
STOVING ENAMELS
★ STOVES BY RADIANT HEAT. LIGHT GAUGE METAL 2 MINUTES. HEAVY GAUGE METAL 3–5 MINUTES.
★ STOVES BY CONVECTION. 10 MINUTES AT 250°F. ALTERNATIVE MATERIAL 1 HOUR AT 250°F. OR ½ HOUR AT 275°F.
★ HIGH OPACITY. ★ BRILLIANT GLOSS. ★ EXCELLENT ADHESION.
★ ONE COAT IS EFFECTIVE ON BARE METAL.
★ HIGH COVERING CAPACITY.
WRITE FOR FULL PARTICULARS TO THE SOLE MANUFACTURERS:—
Goodlass, Wall & Co. Ltd.
INDUSTRIAL DIVISION · GOODLASS ROAD · SPEKE · LIVERPOOL

# NAMES IN THE NEWS

## Appointments

Rushton's (Leeds) Ltd., announce the appointment of **Mr. Frank Spicer** as general manager of the company. Mr. Spicer is well known in finishing trade circles in the North of England and has been the author of technical articles in *Industrial Finishing* and other journals.

**Mr. D. J. D. Unwin** has left the Research and Development Department of United Steel Companies Ltd., to take up an appointment as Assistant Chief Metallurgist with the Park Gate Iron and Steel Co. Ltd.

**Mr. G. H. Duncan** and **Mr. E. J. Farrar** have been appointed to the board of directors of Commercial Solvents (Great Britain) Ltd.

After two years' intensive training in the sales and works departments of the Hymatic Engineering Co. Ltd., the compressed air equipment specialists of Redditch, Worcs., **Mr. K. R. Harris** has been appointed at the age of 22 to the position of Technical Representative for the North of England.

Mr. Harris will be responsible for an area including Yorkshire, Lancashire, plus Stockport and Birkenhead, Durham, Westmorland, Cumberland and Northumberland.

**Styrene Co-Polymers Ltd.,** have appointed two further foreign agents:

*Denmark:* Erik Paulsen, 1 Vestre Farimagsgade, Copenhagen V. Telephone: Byen 9926.

*Switzerland:* Emil Scheller and Co. Ltd., Zurich. Telephone: (051) 32 68 60.

---

**The next meeting** of the Oil and Colour Chemists' Association, London Section, will be on Wednesday, 23rd September, at 7 p.m. The meeting will take place as usual at the Royal Society of Tropical Medicine and Hygiene, Manson House, 26 Portland Place, London, W.1, and will be the chairman's evening. The chairman, Mr. R. F. G. Holness, will give a paper entitled: "Thoughts on Responsibility." A cordial welcome is extended to all members and visitors.

**Mr. E. W. Holmes, F.R.I.C.,** for thirty-four years chemist to John W. Leitch and Co. Ltd., aniline dye manufacturers and makers of intermediate products, of Huddersfield, has retired.

**Mr. G. Copping,** editor of the *Paint and Colour Journal* is going to Toronto at the end of this month to be guest speaker at the Canadian Paint, Varnish and Lacquer Association's annual meeting. He will be giving a talk on the British paint industry.

---

## PAINT ADVISORY COMMITTEE

THE Paint Advisory Committee, originally set up ten years ago to advise the Government on war-time control problems of paint, has now been altered in its composition in order to enable it to continue to give the Board of Trade an accurate and up-to-date picture of the industry.

The Committee will in future have members representing the three trade associations and the export group, as well as its independent members, and trade union representation will be widened

The chairman will continue to be a senior Board of Trade official. Terms of reference will be "to advise the Board of Trade on all matters affecting the paint industry." The Committee will be made up as follows:

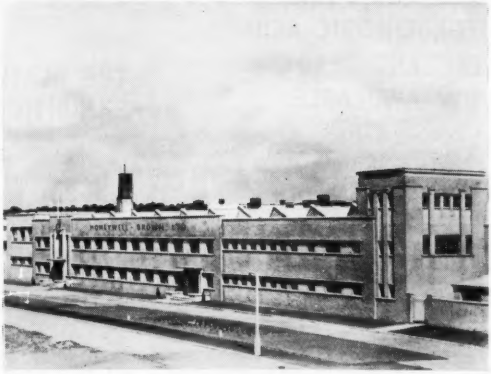
*Independent members:* Mr. H. W. G. Bidgood, Mr. J. Clarkson, Mr. C. A. F. Hastilow, Mr. R. B. E. Jackson, Mr. C. R. Petrie, Mr. E. P. Reynolds.

*Members representing Trade Associations:* Mr. J. W. Cole (as president of the National Paint Federation). Mr. C. A. Carter (as president of the Society of British Paint Manufacturers). Mr. D. E. Roe (the Paint Manufacturers and Allied Trades' Association). Mr. S. W. Greig (as chairman of the Export Group of the Paint Industry).

*Members representing the trade unions:* Mr. A. W. Inman (the National Union of General and Municipal Workers). Mr. A. H. Roullier (the Transport and General Workers' Union). Mr. T. Clare (the Union of Shop, Distributive and Allied Workers).

In addition, the committee can co-opt members of the industry with special knowledge. The Committee has particularly in mind that if problems of application and distribution were to be discussed it might co-opt Mr. V. W. Hosp (the Federation of Painting Contractors) and Mr. A. E. L. Robey (Building Industry Distributors), who were formerly members of the Committee.

## NEW SCOTTISH FACTORY OPENED



The opening of the new Honeywell-Brown factory at Newhouse, Motherwell, Lanarkshire, was marked by an official ceremony on 18th September.

The move from Blantyre to Newhouse took place during the company's annual two-week shut-down period. By the morning when work was to be resumed, everything was ready for normal activity, so that there has been no break in continuity of production.

Our photograph shows the outside elevation of the new premises at Newhouse.

## FIRST EVENING CLASSES IN PACKAGING

THE first evening educational course in packaging to be run in conjunction with a public authority is the outstanding feature of the winter programme of the Institute of Packaging, details of which have now been announced. The object of the educational course is to teach the science of packaging as a technical subject within the framework of evening institute classes provided by the Educational Authority, and this first course, sponsored by the Institute of Packaging in conjunction with the City of Birmingham, is to be held at the Birmingham College of Commerce, Broad Street, Birmingham, every Wednesday night from 30th September-9th December, under the title of "The Practice of Packaging." It is open to anyone above the age of 17, and recruitment is by the normal means of enrolling with the College itself. Full details of the course, and the subject headings and speakers, are available from the Institute at 80 Lancaster Avenue, London, S.E. 27. Telephone: Whitehall, 0737.

The Metal Finishers

General Metal Finishing Processors to Industry.

ESTABLISHED 1922

Protective, Durable and Decorative.

MEMBER OF THE METAL FINISHING ASSOCIATION MFA

Our aim is to be helpful to manufacturers in suggesting alternative Finishes for their products.

ASHTON and MOORE (METAL COLOURERS) LTD
3, LEGGE LANE, BIRMINGHAM 1. Tel: CENtral 2234
PLATING TO B.S.1 OR OTHER STANDARDS ON MINISTRY OF SUPPLY LIST. NO. 7-9686/58

## PHOSPHORIC AND HYDROCHLORIC ACID-RESISTANT ALLOY NOW AVAILABLE

ADDING molybdenum to nickel or to nickel containing small percentages of iron, produces alloys which are strongly resistant to corrosion by hydrochloric and phosphoric acids, and to a lesser extent, by sulphuric acid. The initial work on these alloys was done in the U.S.A. and Germany, and in the form of castings the alloys have been produced in this country for some years. Wrought forms are required, however, often for use in conjunction with castings, and those interested in corrosion problems will be glad to know that Henry Niggin and Co. Ltd., Birmingham, have begun the manufacture of material of this type under the name of "Corronel B.;"*

Previous work on nickel-molybdenum compositions supplemented by investigations carried out in Birmingham show that corrosion-resistance improves with increased molybdenum content, and additions of up to 10 per cent. of iron at the 30 per cent. molybdenum level have no significant influence on corrosion rates. The composition of "Corronel B" is approximately 66 per cent. nickel, 28 per cent molybdenum and 6 per cent. iron.

The new alloy can be satisfactorily worked, although it offers greater resistance to deformation than mild and low alloy steels.

"Corronel B" is highly resistant to hydrochloric acid at all concentrations and temperatures, and has excellent resistance to sulphuric and phosphoric acids in certain ranges of concentration.

* *"Corronel B" is a trade-mark.*

## THE PLATINUM METALS EXHIBITION

THE Institution of Metallurgists announce that H.R.H. The Duke of Edinburgh has graciously consented to open their Platinum Metals Exhibition at Grosvenor House on Monday the 19th October, 1953. The exhibition is being held to mark the Triple Jubilee of the British Scientist, William Hyde Wollaston's announcement of his discovery of the precious metal palladium.

The exhibition which will be open to the public from Thursday, 22nd October to Saturday, 24th October, will show the vital part played by the platinum metals in science and industry today.

## I.M.F. ORGANIC FINISHING GROUP

THE Organic Finishing Group Committee has arranged a number of interesting meetings for the new session which will be held alternately in London and Birmingham at bi-monthly intervals commencing in September. Details of the first meeting are as follows:

*Tuesday, 29th September*

"THE DEVELOPMENT OF MODERN ORGANIC FINISHES," by H. Hollis, B.Sc., A.R.I.C.

The meeting will be held at the British Institute of Management, Management House, Hill Street, off Berkeley Square, London, W.1, commencing at 6.30 p.m.

MIVOC

DRY & WATER WASH
SPRAY BOOTHS

PAINT SHOP EQUIPMENT

DRYING OVENS

VENTILATION

FUME REMOVAL

DUST COLLECTION

PLENUM HEATING

DUCTING, ETC.

MODERN INDUSTRIAL VENTILATION & OVEN CO. LTD.
70-76 ALCESTER ROAD SOUTH, KINGS HEATH, BIRMINGHAM
TELEPHONE: HIG 3019

# ADVERTISERS' INDEX


Adhesive Dusters .. .. .. .. .. 129
Aeraspray Manufacturing Co. Ltd., The .. —
Aerograph Co. Ltd., The .. .. .. 95
Aerostyle Ltd. .. .. .. .. .. 91
Air Industrial Developments Ltd. .. .. *Cover* i
Allied Paints and Chemicals Ltd. .. .. —
Ashton and Moore (Metal Colourers) Ltd. .. 149
Atlas Diesel Co. Ltd. .. .. .. .. —
Atlas Plating Works Ltd. .. .. .. —
Ault and Wiborg Group .. .. .. .. —

Ballard, F. J. and Co. Ltd. .. .. .. —
Bennett (Hyde) and Co. Ltd. .. .. .. —
Berger, Lewis (Great Britain) Ltd. .. .. —
B.H. Chemicals Ltd. .. .. .. .. 80
Bratt Colbran Ltd. .. .. .. .. 98
British Oxygen Co. Ltd. .. .. .. —
British Paints Ltd. .. .. .. .. —
British Vapour Blast Ltd. .. .. .. —
Brough, E. A. and Co. Ltd. .. .. .. —
Bullows, A. and Sons Ltd. .. .. *Cover* iv

Canning, W. and Co. Ltd. .. .. .. 90
Carrier Engineering Co. Ltd. .. .. *Cover* ii
Cellon Ltd. .. .. .. .. .. 87
Controlled Heat and Air Ltd. .. .. .. —
Cooper and Co. (B'ham) Ltd. .. .. .. 96
Cox Bros. and Co. (Derby) Ltd. .. .. 89
Croda Ltd. .. .. .. .. .. —
Cruickshank, R. Ltd. .. .. .. .. 139

Dawson Bros. Ltd. .. .. .. .. 100
De La Rue, Thomas and Co. Ltd. .. .. —
Delta Technical and Commercial Services .. —
Drummond Patents (Holdings) Ltd. .. .. 137

Electric Construction Co. Ltd., The .. .. 135
Electro-Chemical Engineering Co. Ltd., The 83

Fishburn Printing Ink Co. Ltd. .. .. —
Fletcher, Miller Ltd. .. .. .. .. 99

Gas Council, The .. .. .. .. .. 82
General Electric Co. Ltd., The .. .. 88
General and Industrial Paints Ltd. .. .. —
Gittings and Hills Ltd. .. .. .. .. 119
Goldsworthy, Thomas and Sons Ltd. .. —
Goodlass, Wall and Co. Ltd. .. .. .. 147
Grauer and Weil Ltd. .. .. .. .. 152
Griffiths, A. E. (Smethwick) Ltd. .. .. 81

Hall, John and Sons (Bristol and London) Ltd. .. .. .. .. .. .. 115
Hawley, John and Co. (Walsall) Ltd. .. —
Heat and Air Systems Ltd. .. .. .. —
Hockley Chemical Co. Ltd., The .. .. —
Holden, Arthur and Sons Ltd. .. .. 93
Honeywell-Brown Ltd. .. .. .. .. —

Industrial Fan and Heater Co. Ltd. .. .. —
International Paints Ltd. .. .. .. 102
Imperial Chemical Industries Ltd. (Paints Division) .. .. .. .. .. —
Incandescent Heat Co. Ltd. .. .. .. —
Ingham Clark, Robert and Co. .. .. —
Ionic Plating Co. Ltd. .. .. .. .. —

Jenolite Ltd. .. .. .. .. .. —
Jenson and Nicholson Ltd. .. .. .. —

Kaylee Transfers Ltd. .. .. .. .. 98
Kearsley, Robert and Co. .. .. .. 99

Learner, A. and Co. Ltd. .. .. .. 131

McDowell, Thomas and Co. Ltd. .. .. —
Macpherson, Donald and Co. Ltd. .. .. 141
Mander Bros. Ltd. .. .. .. .. 133
Metallisation Ltd. .. .. .. .. —
Metal Porcelains Ltd. .. .. .. .. —
Metropolitan-Vickers Electrical Co. Ltd. .. —
Midland Galvanizers Ltd. .. .. .. —
Minnesota Mining and Manufacturing Co. Ltd. .. .. .. .. .. —
Modern Industrial Ventilation and Oven Co. Ltd. .. .. .. .. .. 150
Morris, B. O. Ltd. .. .. .. .. 143

Nu-Swift Ltd. .. .. .. .. .. 127
Neil and Spencer Ltd. .. .. .. .. 94
Norgren, C. A. Ltd. .. .. .. .. —

Parkinson and Cowan (Gas Meters) Ltd. .. 145
Parsons, Thomas and Sons Ltd. .. .. 94
Perfectair Ltd. .. .. .. .. .. —
Pinchin, Johnson and Associates Ltd. .. 77
Postans Ltd. .. .. .. .. .. —
Preston, John and Co. Ltd. .. .. .. —
Prodorite Ltd. .. .. .. .. *Cover* iii
Pyrene Co. Ltd., The .. .. .. .. 125

Radiant Heating Ltd. .. .. .. .. 85
Radiant Metal Finishing Co. Ltd. .. .. 96

Scrib Ltd. (Metal Section) .. .. .. —
Shell Chemicals Ltd. .. .. .. .. 79
Spencer and Halstead Ltd. .. .. .. —
Sterne and Co. Ltd. .. .. .. .. —
Stordy Engineering Ltd. .. .. .. 97
Sunbeam Anti-Corrosives Ltd. .. .. —

Tack All Tackrag (Eng.) Ltd. .. .. .. —
Technical Brushes Ltd. .. .. .. —
Teleflex Products Ltd. .. .. .. .. 78
Thornley and Knight Ltd. .. .. .. 84
Thompson Bros. Ltd. .. .. .. .. 86
Tilghman's Patent Sand Blast Co. Ltd. .. —
Trapinex Ltd. .. .. .. .. .. —

Vacuum Industrial Applications Ltd. .. —

Walterisation Ltd. .. .. .. .. —



**BUSINESS FOR SALE**

**CENTRAL LONDON.** Small, old-established platers' business for sale. Two-floor workshop 1,100 sq. ft. and living accommodation. Freehold £3,000. Apply to Chamberlain and Willows, 9/13 Pentonville Road. N.1. Telephone: Term. 2241.



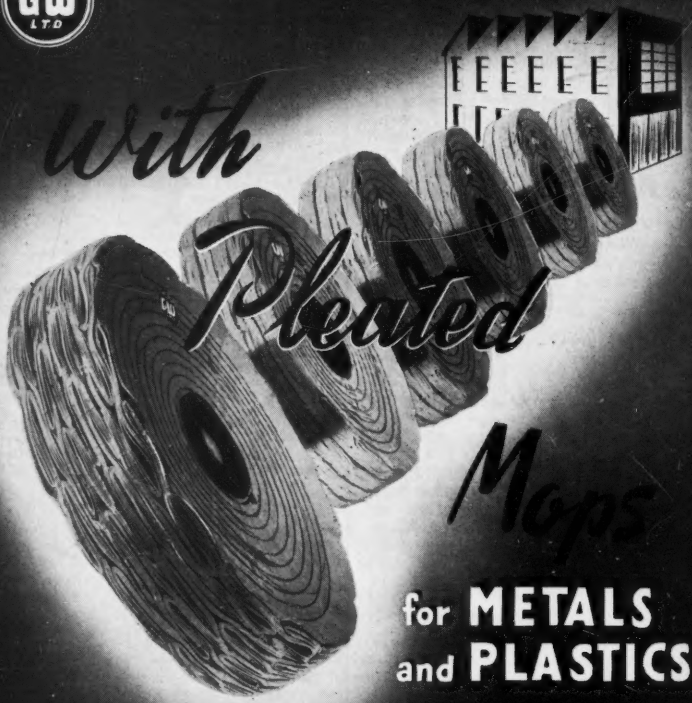
*This is an Arrow Press Publication. Published Monthly.*
*Subscription Rate 30s. per annum.*
*Published by Arrow Press Ltd. at 157 Hagden Lane, Watford, Herts.*
*Telegrams: "Techpress, Watford." Telephone: Gadebrook 2308/9.*

MADE AND PRINTED IN GREAT BRITAIN FOR THE PROPRIETORS, ARROW PRESS LTD., BY THE SIDNEY PRESS LIMITED, LONDON AND BEDFORD.

GW LTD

# PERFECT POLISHING

*With Pleated Mops*



for **METALS** and **PLASTICS**

The folds in the construction of these mops tend to obviate the fine parallel polishing marks produced by the use of conventional mops made from parallel discs.

## GRAUER & WEIL LTD.

ESTABLISHED 1892

HARDWICK STREET, LONDON, E.C.1. Phone TERMINUS 2414 (2 lines) Grams GRAUERS SMITH, LONDON

MANUFACTURERS AND SUPPLIERS OF COMPLETE ELECTRO PLATING PLANTS INCLUDING RECTIFIERS, TANKS, ANODES, SALTS AND CLEANERS

S

D.

NG